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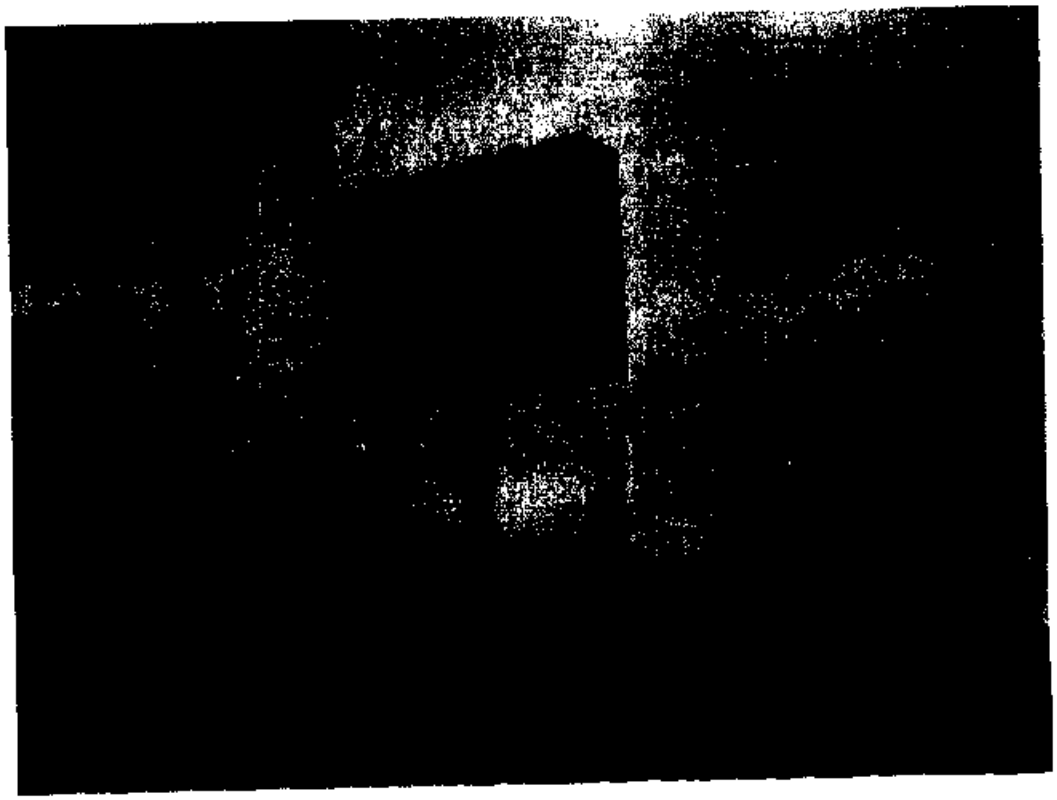
NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

Superfund Five-Year Review Report
ABC One Hour Cleaners
Jacksonville, Onslow County, North Carolina
EPA ID: NCD 024644494



Prepared for the
US Environmental Protection Agency
Region 4

August 2003

FIVE-YEAR REVIEW REPORT
ABC ONE HOUR CLEANERS
EPA ID: NCD 024644494

Prepared for the
US Environmental Protection Agency
Region 4

Prepared by the
State of North Carolina
Department of Environment & Natural Resources

August 2003

Approved by:

Winston A. Smith, Director
Waste Management Division

Date:

8/29/03

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BGS	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
CFR	Code of Federal Regulations
CWA	Clean Water Act
DCE	Dichloroethene
EPA	United States Environmental Protection Agency
FS	Feasibility Study
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCAC	North Carolina Administrative Code
NC DENR	North Carolina Department of Environment and Natural Resources
NCSWQS	North Carolina Surface Water Quality Standards
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCD	Natural Resources Community Development
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethene
PCOR	Preliminary Close-Out Report
PRP	Potentially Responsible Party
PSD	Performing Settling Defendant
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study

ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SPM	Soil Pressure Monitoring
SOW	Statement of Work
SVE	Soil Vapor Extraction
TCE	Trichloroethene
TSS	Total Suspended Solids
USMC	United Stated Marine Corp
VOC	Volatile Organic Compound
WiRO	Wilmington Regional Office

Executive Summary

The ABC One-Hour Cleaners site is located at 2127 Lejeune Boulevard, Jacksonville, Onslow County, North Carolina, and encompasses an area of approximately 1 acre. From 1964 to 1985, ABC Cleaners disposed of spent solvents and "still bottoms" (powder residue), as well as, possible septic tank leakage with high concentrations of spent solvents on the property in unlined, un-contained media. In 1984, as part of a routine water quality evaluation, the Department of the Navy collected groundwater samples and determined that dichloroethene (DCE), trichloroethene (TCE), and tetrachloroethene (PCE) were present in 10 of the 40 wells sampled. Two of these wells were located within the Tarawa Terrace well field in the vicinity of the ABC Cleaners. In 1985, the Wilmington Regional Office (WiRO) of the Division of Environmental Management, North Carolina Department of Natural Resources and Community Development (NRCD) conducted a groundwater pollution study to define the source of PCE in wells within the Tarawa Terrace well field. The study concluded that the most likely source of groundwater contamination was ABC One-Hour Cleaners.

The remedial actions in the Record of Decisions (RODs) dated January 28, 1993 for OU 1, provided remediation of contaminated groundwater, and the second ROD dated September 6, 1994 for OU 2, provided remediation of contaminated soils. As stated in the RODs, contaminated groundwater will be extracted from the Surficial and the Castle Hayne aquifers using extraction wells the extracted groundwater will be treated by air stripping and an off-gas treatment system. Surface water discharge of the treated groundwater will be to Northeast Creek via a National Pollutant Discharge Elimination Systems (NPDES). Contaminated soils will be remediated using Soil Vapor Extraction (SVE). Institutional controls will be implemented for both operable units.

This is the first five-year review for the ABC One-Hour Cleaner Site. The triggering action for this statutory review is the release of funds for the beginning of the soil remedial action on August 31,1998. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. There are several issues/problems that have been identified during this review. The most significant of these being:

1. Institutional controls as proposed in the RODs have not been implemented.

2. At this time, groundwater contamination in the surficial and Castle Hayne aquifers may not be contained. It is not clear that the zone of influence of the recovery wells is capturing downgradient contamination.

3. The extent of contamination needs to be investigated in the Castle Hayne aquifer.

4. It is now technically possible to obtain lower quantitation limits in water samples for two site specific compounds, PCE and vinyl chloride. Therefore, clean-up goals of 0.7 ug/l for PCE and 0.5 ug/l for vinyl chloride should be changed to reflect these new values.

Other minor issues that need to be addressed, include leaks in and/or around the groundwater treatment building, housekeeping issues and improvement of the aesthetics of the area surrounding the groundwater treatment building, and soil monitoring needs to be more routine.

The remedies at OU1 and OU 2 currently protect human health and the environment in the short-term because the main source of contamination is being remediated through the soil vapor extraction system and currently no human exposure pathways exist to contaminated soil or groundwater. However, in order for the remedies to be protective in the long-term, the following actions need to be taken to ensure long-term protectiveness: Implementation of Institutional Controls as stated in the RODs; A formal review should be conducted for optimizing the remedial systems for groundwater; and Further groundwater investigation of the Castle Hayne Aquifer.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: ABC One Hour Cleaners		
EPA ID *(from WasteLAN)*: NCD 024644494		
Region: 4	**State:** NC	**City/County:** Jacksonville/Onslow
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete		
Multiple OUs?* ☒ YES ☐ NO	**Construction completion date:** 8 / 9 / 2000	
Has site been put into reuse? ☐ YES ☒ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other		
Author(s) name: Nile Testerman/Stephanie Grubbs		
Author(s) title: Engineer/Hydrogeologist	**Author(s) affiliation:** NC DENR	
Review period: 4 / 1 / 2003 to 8 / 31 / 2003		
Date(s) of site inspection: 5 / 5 / 2003		
Type of review: Statutory		
Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other		
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____ ☐ Construction Completion ☐ Previous Five-Year Review Report ☒ Other (specify) Release of funds for the beginning of the soil remediation action		
Triggering action date *(from WasteLAN)*: 8 / 31 / 1998		
Due date *(five years after triggering action date)*: 8 / 31 / 2003		

Five-Year Review Summary Form, cont'd

Issues:
1. Institutional controls as proposed in the RODs have not been implemented.
2. Groundwater contamination in the surficial and Castle Hayne aquifers may not be contained. It is not clear that the zone of influence of the recovery wells is capturing downgradient contamination.
3. The extent of contamination needs to be investigated in the Castle Hayne aquifer.
4. It is now technically possible to obtain lower quantitation limits in water samples for two site specific compounds, PCE and vinyl chloride. Therefore, clean-up goals of 0.7 ug/l for PCE and 0.5 ug/l for vinyl chloride should be changed to reflect these new values.

Recommendations and Follow-up Actions:
Major recommendations involve: Implement institutional controls, conduct formal review for optimizing the groundwater remedial system, investigate further the Castle Hayne Aquifer, and modify groundwater clean-up goals. Other minor issues include housekeeping issues and improve the general appearance of the groundwater treatment plant area, leaking and plumbing in the groundwater treatment building, and more routine soil monitoring.

Protectiveness Statement:
The remedies at OU1 and OU 2 currently protect human health and the environment in the short-term because the main source of contamination is being remediated through the soil vapor extraction system and currently no human exposure pathways exist to contaminated soil or groundwater. However, In order for the remedies to be protective in the long-term, the following actions need to be taken to ensure long-term protectiveness: Implementation of Institutional Controls as stated in the RODs; A formal review should be conducted for optimizing the remedial systems for groundwater; and Further groundwater investigation of the Castle Hayne Aquifer.

1.0 Introduction

The purpose of conducting a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The North Carolina Department of Environment and Natural Resources (NC DENR) is preparing this Five-Year Review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The United States Environmental Protection Agency (US EPA) interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the first five-year review for the ABC One-Hour Cleaner Site (ABC Cleaners). The triggering action for this statutory review is the release of funds for the beginning of the soil remedial action on August 31,1998. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. This Five Year Review was performed in a manner consistent with the latest US EPA Comprehensive Five-Year Review Guidance (USEPA, 2001).

2.0. Site Chronology

Table 1 lists the site chronology for selected events for the ABC Cleaners site.

Table 1 - Chronology of Site Events

Event	Date
ABC Cleaners disposed of spent solvents and "still bottoms" (powder residue), as well as, possible septic tank leakage with high concentrations of spent solvents on the property in unlined, un-contained media.	1958 to 1985
Routine water quality evaluation by the US Navy discovered DCE, TCE, and PCE in community wells at Tarawa Terrace.	July 1984
Wilmington Regional Office (WiRO) of the Division of Environmental Management, notified by USMC that the Tarawa Terrace were contaminated by off-site sources.	April 1985
WiRO conducted a groundwater pollution study to define source within the Tarawa Terrace well field. Which concluded that the source was from the ABC One-Hour Cleaners.	April - September 1985
Preliminary Assessment report completed by the North Carolina Department of Health Services CERCLA Unit	September 11, 1986
Site Inspection complete by the North Carolina Department of Health Services CERCLA Unit	May 27, 1987
Site proposed to the National Priorities List (NPL)	June 24, 1988
Site finalized for the NPL	March 31, 1989
Remedial Investigation and Feasibility Study (RI/FS) complete for Operable Unit 1 (OU1, groundwater contamination)	November 5, 1992
The Acting Regional Administrator signed the Record Of Decision (ROD) documenting the Remedial Action (RA) for OU 1	January 26, 1993
FS complete for Operable Unit 2 (OU 2, soil contamination)	March 18, 1994
RI complete for OU 2	May 13, 1994
The second ROD was signed documenting the RA for OU 2	September 6, 1994
National Pollutant Discharge Elimination System (NPDES) permit issued by NC DENR for treated groundwater	June 1995
Right of Way access requested for a groundwater remediation system pipe to be installed under Southern Norfolk Railroad	February 1997 to August 1998
Bid process complete and Foster Wheeler Environmental Corporation is awarded the RA subcontract for OU 1	June 7, 1997
Right of Way signed for access to install pipe beneath railroad	August 10, 1998

Release of funds for the remedial action for OU 2 (trigger for start of 5-year review)	August 31, 1998
Foster Wheeler starts-up the groundwater system and completes the performance demonstration	January 1999 - November 1999
Bid process complete and McLaren-Hart is awarded subcontract for OU 2	July 30, 1999
Foster Wheeler and Weston (EPA contractor) have conflicts regarding violations with NPDES permit due to increased nickel concentrations and total suspended solids (TSS), flow rate issues, delays in start of remediation system, and iron fouling the system.	Late 1999
GW remediation system basically shut-down due to high concentrations of nickel and total suspended solids (TSS) in effluent.	February 2000 to March 2002
Construction complete for OU 1	February 2000
Soil Vapor Extraction (SVE) system for OU 2 started operating by McLaren-Hart.	April 2000
Foster Wheeler filed a lawsuit against Weston citing breach of contract, declaratory judgement that the subcontract expired, declaring judgement that Foster Wheeler was not in default, and breach of the Duty of Good Faith and Fair Dealings.	August 4, 2000
Construction complete for OU 2	August 9, 2000
SVE system is fully operational and meets Statement of Work (SOW) requirements.	August 28, 2000
McLaren-Hart is purchased by J. A. Jones . A newly-formed McLaren-Hart/Jones Company is established as a subsidiary of J. A. Jones Environmental Services.	October 2000
NPDES permit changed from Foster Wheeler to Weston as owner of the system.	May 31, 2001
Modified NPDES permit which reflects dilution calculated in Cormix Mixing Analysis and discharge pipe can be extended to discharge into Northeast Creek.	October 1, 2001
GW system started again by Weston.	March 20, 2002
Superfund Preliminary Close-Out Report (PCOR) complete.	August 8, 2002
GW system off and on sporadically due to minor problems and repairs.	October 2002-March 2003
GW system restarted by Terraine (Weston subcontractor) and is fully operational.	March 15, 2003

3.0 Background

3.1 Site Description

The ABC One-Hour Cleaners site is located at 2127 Lejeune Boulevard, Jacksonville, Onslow County, North Carolina, and encompasses an area of approximately 1 acre. The area surrounding the site is a business district of Jacksonville and north of the Camp Lejeune Marine Corps Base (Base). The dry cleaning establishment, consisting of three buildings joined to form one complex, is located on the southern portion of the property. The back portion of the property is overgrown with vegetation and is surrounded by a chain-link fence. A small parking lot fronts Lejeune Boulevard and driveways exist on the east and west of the complex. Across Lejeune Boulevard to the south and southeast are the Norfolk Southern Railroad tracks, the Base, and the Tarawa Terrace Housing Development. The Tarawa Terrace complex serves as housing for non-commissioned officers of the Base and their families.

The Site is situated at an elevation of about 30 feet above mean sea level (msl). Surface water run-off flows overland into ditches and culverts that are directed across Lejeune Boulevard (Highway 24) onto Base property and, along with run-off from the Base, into Northeast Creek. Approximately 4,400 feet southeast of the Site, Northeast Creek flows in a southwesterly direction to the New River, which drains into the Atlantic Ocean (USEPA, 2002; USEPA, 1994). Elevations decline gradually toward the south and southeast, toward Northeast Creek. Figure 1 is a site vicinity map showing the site, the Base, and Northeast Creek.

The soils at the Site have been classified within the Onslow fine sandy soil association. Underlying the surface soils (approximately 5- to 7-inches thick) is a 6- to 8-inch thick hardpan layer. This hardpan is composed of fine sand cemented with organic matter and iron, and may locally inhabit the downward movement of recharge. Shallow subsurface geology specific to the site was determined to include 2 aquifers. The surficial aquifer is primarily saturated quartz sands which extends to a depth of 70-feet Below Ground Surface (BGS). Overlying the saturated sand is a zone composed of interbedded sands, silts, and clays which extend from the ground surface to approximately 25 feet BGS. Underlying the surficial aquifer is the Castle Hayne which is primarily composed of saturated fossiliferous sand and gravel with variable silt content. A noncontiguous confining unit has been located separating the surficial and Castle Hayne aquifers.

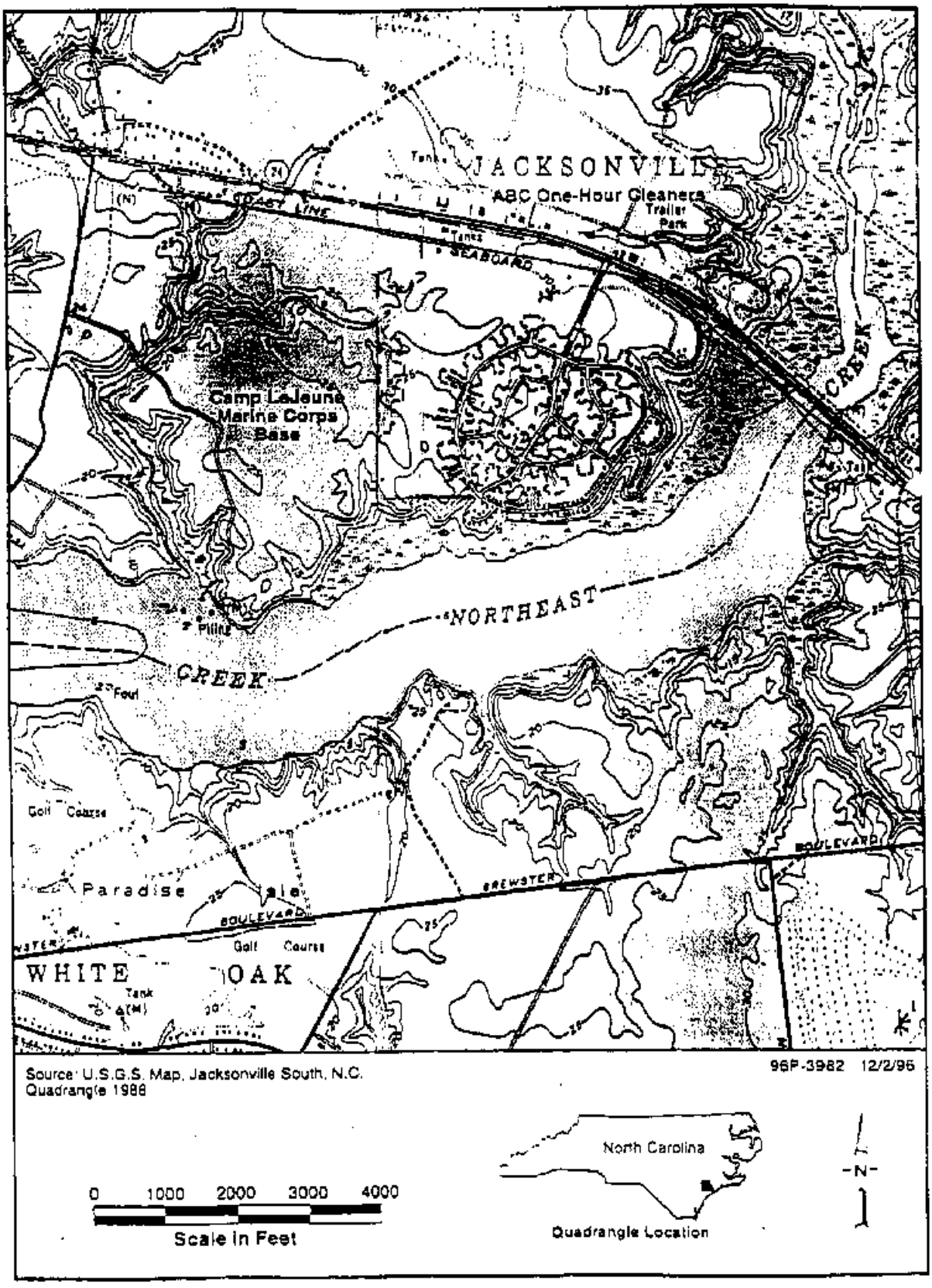


FIGURE 1 SITE VICINITY MAP

3.2 Land and Resource Use

ABC Cleaners is currently operating at the facility. The general land use within in the area is general retail and commercial business properties. To the north of the Site are residential areas. Land located to the south serves as housing for the Base and undeveloped woodland areas. Since February 1985, Tarawa Terrace is supplied water by the Camp Lejeune Holcomb Boulevard drinking water system.

3.3 History of Contamination

ABC Cleaners is a North Carolina corporation registered with the Secretary of State as of March 4, 1958. Martha Melts and Milton Melts purchased the property on which the ABC Cleaners facility is located on September 16, 1964. From 1964 to 1985, ABC Cleaners disposed of spent solvents and "still bottoms" (powder residue) on the property in unlined, un-contained media. It is estimated that approximately one ton of still bottoms were placed on the driveway over a 30-year operating period.

A septic tank soil absorption system was located in the rear of the building complex. The septic system consisted of an underground concrete tank with a concrete lid and a pipe of unknown length that discharged into the subsurface soil. The septic system was located within 4 feet of the PCE storage tank. The age of the septic system reportedly dates back to the original construction of the building in the 1940's. ABC Cleaners began occupying the building in 1955. In the 1960s, ABC Cleaners installed a floor drain to the septic tank and tied its wastewater discharge, except for its lavatories, into the Weyerhaeuser Properties' water and sewer system. The lavatories remained tied into the septic system until approximately 1985, at which time they were also tied into the Weyerhaeuser Properties' system.

In July 1984, as part of a routine water quality evaluation, the Department of the Navy collected groundwater samples from 40 of the 100 community water supply wells located on the Base. The Navy determined that dichloroethene (DCE), trichloroethene (TCE), and tetrachloroethene (PCE) were present in 10 of the wells sampled. Two of these wells were located within the Tarawa Terrace well field in the vicinity of the ABC Cleaners.

In April 1985, the Wilmington Regional Office (WiRO) of the Division of Environmental Management, North Carolina Department of Natural Resources and Community Development (NRCD) was notified by the United States Marine Corps (USMC), that two deep-water wells in the Tarawa Terrace housing area at the Base were contaminated by what appeared to be off-site sources. From April through September 1985, WiRO staff conducted a groundwater pollution study to define the source of PCE in wells within the Tarawa Terrace well field. The study concluded that the most likely source of groundwater contamination was ABC One-Hour Cleaners.

In data collected in February 1985, the two Tarawa Terrace wells contained maximum concentrations of PCE at 1,580 ppb, TCE at 57 ppb, DCE at 92 ppb and vinyl chloride at 27 ppb. On February 8, 1985 the wells are shut down. All contaminated wells in Tarawa Terrace are now offline.

The soil contamination on site was a result of disposing spent solvents and "still bottoms" (powder residue), as well as, possible leaks from the septic tank system onto unlined, un-contained media. Based on data collected in a 1986 investigation, maximum concentrations of contaminants within soils on site were 860 mg/kg (ppm) PCE, 24 mg/kg TCE, and non-detect for 1,2-DCE, 1,1-DCE, and vinyl chloride. However, data collected during the RI found levels of 1,2-DCE and vinyl chloride at mean concentrations of 5.0 mg/kg and 0.135 mg/kg, respectively. A septic tank sample, also collected during the RI, indicated that the concentrations of PCE was estimated to be approximately 230,000μg/L, representing a significant contaminant source.

4.0 Remedial Actions

4.1 Remedy Selection

The remedial actions in the Record of Decisions (RODs) dated January 28, 1993 for OU 1, provided remediation of contaminated groundwater, and the second ROD dated September 6, 1994 for OU 2, provided remediation of contaminated soils. The description of the selected remedies in the RODs include:

Groundwater

- Contaminated groundwater above ARARs will be extracted from the Surficial and the Castle Hayne aquifers using extraction wells;
- The extracted groundwater will be treated by air stripping and an off-gas treatment system (if needed);
- Surface water discharge of the treated groundwater will be to Northeast Creek via a National Pollutant Discharge Elimination Systems (NPDES);
- Periodic monitoring will be conducted to assess the effectiveness of the remedy for a period of up to 30 years; and
- Institutional controls will be placed on well construction and water use in the general area of the site.

Table 2: For OU1- Groundwater, the ROD specified the following clean-up goals:

CONTAMINANT	CLEAN-UP LEVEL (ug/l)
tetrachloroethene	1
trichloroethene	2.8
1,2-dichloroethene	70
vinyl chloride	1

Soils

- Remediation of contaminated soils using Soil Vapor Extraction (SVE); and
- Implementation of institutional controls.

Table 3: For OU2 - Soils, the ROD specified the following clean-up goals:

CONTAMINANT	CLEAN-UP LEVEL (mg/kg)
tetrachloroethene	2.16
trichloroethene	0.90
1,2-dichloroethene	21.0
vinyl chloride	0.03

The remedies were selected to protect human health and the environment, comply with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action and be cost effective. The primary goal of the remedy was to minimize the migration of contaminants from the property that could degrade groundwater quality and prevent further migration of groundwater contamination beyond its current extent. These remedies utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduce the toxicity, mobility, and/or volume as a principal element.

Because these remedies may result in hazardous substances remaining on site above ARARs for more than five years, Five-Year Reviews will be completed to assess site conditions, contaminant distributions, and any other associates site hazards.

4.2 Remedy Implementation

OU 1-Groundwater

The Acting Regional Administrator signed the Record Of Decision (ROD) documenting the Remedial Action (RA) for OU 1 (groundwater contamination) on January 26, 1993. Based on the November 4, 1997 Work Plan for the Groundwater Remediation, Foster Wheeler Environmental Corporation designed the groundwater extraction and treatment system. The system selected for the site consists of extraction wells and a low profile air stripper. The objectives of the groundwater treatment system was designed to reduce the contaminants of concern (COC) and to met the NPDES permit requirements for discharge into Northeast Creek. The current treatment system consists of two pumps, a series of bag filters, and an air stripper (tray aeration system).

During February 1997, a Right of Way access was requested for a groundwater remediation system pipe to be installed under Norfolk Southern Railroad. Access was not granted until August 1998. From January 1999 to November 1999, Foster Wheeler completes the performance demonstration of the groundwater system. Data collected revealed that the original four recovery wells were unable to achieve the required pumping rate. Because the wells only extended partially into the surficial aquifer, four additional wells were extended the entire length of the aquifer. These wells did not provide sufficient flow rates, due to lack of proper well development, so the wells were pumped at a lower flow rate. It was verified that the capture zone included the entire known area of contamination. Since start-up of the system, nickel removal filters were not removing enough nickel to comply with the NPDES permit requirements. Other system problems include iron fouling the filtration media and the total suspended solids periodically exceeding the discharge limit. After several months of testing, Foster Wheeler abandoned operations and Weston took over the start-up of the system. As of October 1, 2001, a new NPDES permit was obtained which reflected Weston as the owner of the system and new dilution calculations based on the CORMIX Mixing Analysis. Based on this analysis, a discharge pipe was extended to discharge into Northeast Creek. On March 20, 2002 the groundwater remediation system was started-up by Weston. On July 25, 2002 EPA and NC DENR conducted a final inspection and determined that the contractors have constructed the remedy in accordance with the remedial design (RD) plans and specifications. By March 2003, the system is fully operation under the supervision of Terraine (Weston's subcontractor).

OU 2-Soil

The release of funds for the remedial action for OU 2 was August 31, 1998, also the trigger for start of 5-year review process. On January 18, 2000 McLaren/Hart, Inc. completed the Work Plan for the Soil Remediation at the ABC Cleaners site. The objectives of the plan were to properly dispose of the contents of the septic tank and seal

the opening with a concrete cap; install SVE extraction wells to remove soil vapor from unsaturated zone and to maintain a negative subsurface pressure of (at a minimum of) 0.5 inches of water at all soil pressure monitoring (SPM) probes; verify that samples collected at five locations be less than the soil remediation goals after a maximum of 2 years from the date of the contract award; SVE system shall operate until remediation goals are achieved; and the system may discharge a maximum of 1.1 pounds (lbs.) of VOC per hour and 1.05 lbs. of PCE per hour without an air emission control device. On August 28, 2000 the SVE system operated by McLaren-Hart is fully operational and meets Statement of Work (SOW) requirements. Prior to August 2000, some extraction wells and SPM probes were malfunctioning. Currently all wells and probes are functional and the system has been fully operational since. Based on data collected in October 2002, the VOC removal rate is approximately 1.8 lbs. per week compared to the 50 lbs. per week in late 2000. The mass recovery rate has slowed as the contaminant levels in the soil decrease.

4.3 System Operation/Operation and Maintenance

The primary activities associated with O&M include:

- Inspection of the conditions of the soil vapor extraction wells and the groundwater monitoring and recovery wells. As well as inspections of both the groundwater and soil remediation systems.
- Weekly inspection or replacement of bag filters due to iron build-up in the groundwater monitoring system. Weekly inspection and periodic cleaning of the air stripper trays.
- Weekly inspection of air flow and vacuum gages for the SVE system.
- Environmental monitoring including semi-annual monitoring of groundwater and bimonthly NPDES compliance sampling and quarterly acute toxicity test sampling. Soil monitoring includes monthly air emissions sampling for each COC. Soil sampling will occur to verify if remediation goals have been met once air emission monitoring indicates COC are not detected.

The original cost estimate to implement the OU1 groundwater remedial action, as described in the ROD, was $2,262,900. More detailed cost estimate documentation can be found in the feasibility Study for OU1. The bid price for the project submitted by the RA-subcontractor was $732,781. After EPA's subcontractor took over the project and made modifications, an additional $60,000 were spend on construction costs. To date the total construction cost for OU1 is $792,781. Based on the Interim Remedial Action Report dated May 2002, the groundwater remediation system is expected to operate for approximately 30 years.

The original cost estimate to implement the remedial action described in the ROD for OU2 soil was $ 521,463. The original bid submitted by the RA-Subcontractor was $156,550. The cost of the optimization activities performed to the SVE system was $4,500. To date the total construction costs for OU2 is $161,050.

4.4 Progress Since Last Five-Year Review

Since this is the first Five-Year Review Report, no other report is available.

5.0 Five-Year Review Process

5.1 Administrative Components

The five-year review process for the ABC One-Hour Cleaners site was performed by the NC DENR, Superfund Section. Nile Testerman (Environmental Engineer) and Stephanie Grubbs (Hydrogeologist) from NC DENR were responsible for gathering and reviewing data for this review. Telephone or email discussion/interviews with Luis Flores, EPA Remedial Project Manager (RPM), and Brian McGee, Project Manager for Weston, were conducted. Other activities conducted for this review include document review, site inspections/site meeting with Terraine and J. A. Jones on May 5, 2003, community involvement interviews (conducted by Diane Barrett, USEPA), and the Five-Year Report preparation.

5.2 Community Involvement

Telephone interviews for the 5-year review of remedial activities for the ABC One-Hour Cleaner were conducted by Diane Barrrett, EPA Community Involvement Coordinator between May 30 and June 20, 2003. Copy of the telephone interview notes are included in Attachment 4.

5.3 Document Review

This five-year review consisted of a review of relevant documents including the Signed RODs for both operable units, RI reports for OU1 and OU2, Interim Remedial Action Reports, and the Preliminary Close-Out Report (PCOR). Applicable groundwater and soil clean-up standards and other ARARs, as listed in the RODs, were also reviewed and checked for updates. See Attachments for a complete list of documents reviewed.

5.4 ARAR Review

In performing the five-year review for compliance with applicable or relevant and appropriate requirements (ARARs), only those ARARs addressing risk posed to human health and the environment (ie: addressing the protectiveness of the remedy) were reviewed. This is in keeping with current US EPA guidance on five-year reviews:

Federal ARARs

- 40 CFR Parts 261, 262, 263, 264, and 268 promulgated under the autholirty of the Resource Conservation and Recovery Act (RCRA)
- Clean Water Act Water Quality Criteria (CWA Part 303, 40 CFR Part 131)
- Safe Drinking Water Act (SDWA) National Primary Drinking Water Standards (40 CFR Part 141)
- SDWA National Secondary Drinking Water Standards (40 CFR Part 143)
- SDWA Maximum Contaminant Levels Goals (40 CFR Part 141)
- CWA National Pollutant Discharge Elimination System (NPDES) Requirements (CWA Part 402; 40 CFR Part 125)
- CWA National Pretreatment Standard for Indirect Discharge to a POTW (CWA Part 307(b); 40 CFR Part 403)
- CWA Technology-Based Effluent Limitations (CWA Part 301(b))
- Solid Waste Disposal Act (40 USC §6901-6987; 40 CFR Part 261)

State ARARs

- Regulations for the Management of Hazardous Waste promulgated under the authority of the NC Waste Management Act (North Carolina Administrative Code (NCAC) Title 15A, Chapter 13A)
- Regulations for the disposal of Solid Waste promulgated under the authority of the NC Hazardous Waste Commision Act (NCAC Title 15A, Chapter 13B)
- NC Drinking Water and Groundwater Standards; Groundwater Classifications and Standards (NCAC Title 15 Chapter 2L)
- NC Surface Water Quality Standards (NCSWQS) Classification and Water Quality Standards (NCAC Title 15 A Chapter 2B)
- NCSWQS Technology-Based Effluent Limitations (NCAC Title 15A Chapter 2, Subschapter 2B.0400)
- NC Drinking Water Act (NCDWA) (General Statutes Chapter 130A, Article 10)
- NC Water Pollution Control Regulations (NCWPCR) (NCAC Title 15 Chapter 2, Subchapter 2H)
- NCWPCR Wastewater Treatment Requirements (NCAC Title 15 Chapter 2, Subchapter 2H.0100)

Analytical capabilities have changed since the ROD for OU1 was prepared. Most significantly, quantitation limits in most cases are lower than the ROD clean-up levels. It is now technically possible to obtain lower quantitation limits in water samples for two site specific compounds, PCE and vinyl chloride. At the time of the ROD, the quantitation limits for PCE and vinyl chloride were 1 ug/l. This limit of 1 ug/l was then specified in the ROD as the clean-up goals in groundwater for PCE and vinyl chloride. Currently, the quantitation limits for PCE and vinyl chloride are 0.5 ug/l. The NC Groundwater Standard, as stated in the NC Drinking Water and Groundwater Standards; Groundwater Classifications and Standards (NCAC Title 15 Chapter 2L), is 0.7 ug/l for PCE and 0.015 ug/l for vinyl chloride. Therefore, clean-up goals of 0.7 ug/l for PCE and 0.5 ug/l for vinyl chloride would be decreased to these new values.

At the time the ROD for OU 2 was prepared, a baseline risk assessment was conducted. The soil clean-up goals as stated in the ROD are still applicable.

5.5 Data Review

Groundwater

The data review for the groundwater monitoring consisted of evaluation of pre-remedial data from April 1992 and September 1993 and data collected after the start-up of the remediation system dated May 2002 to March 2003. The data from March 2003 is the most current data available. The main resources for this data is the *Draft Performance Remedial Design, Operable Unit 1* dated July 7, 1994, *ABC One-Hour Cleaners Groundwater Sampling Results -November 2002* dated February 3, 2003, and the most current data from Weston dated July 2003 (the most current data was provided via email from Weston since a final report was not available).

Groundwater sampling data was reviewed for sampling events occurring in April 1992, September 1993, May 2002, August 2002, November 2002, and March 2003. Gaps in the data from 1993 to 2002 are due to the extensive problems including obtaining railroad access agreements, exceeding NPDES permit requirements, and contractor disputes. Table 4 presents all the pre-remedial action sampling data from 1992 and 1993 for the surficial aquifer. Table 5 presents all the pre-remedial action sampling data from 1992 and 1993 for the Castle Hayne aquifer. Data from the most current sampling events May 2002, August 2002, November 2002, and March 2003 are represented in Table 6 from the surficial aquifer and Table 7 from the Castle Hayne aquifer. Figure 2 is a site map with all the monitoring wells locations.

Based on the data from the 2002 sampling events, Weston concluded that the VOC concentrations increased significantly in RWS-4A and decreased significantly in well C-13. VOC concentrations on S-2, on ABC property, decreased more than five-fold between May and November 2002. VOC concentrations in well RWC-1 decreased in December 2002, even thought there was an increase between May and August. The remaining wells have been fairly consistent and many show a slight downward trend. The VOC plume appears

to be elongating to the east-southeast in both aquifers and migration has proceeded further into the Castle Hayne. The highest VOC concentrations (greater than 1,000 µg/l) were found in two recovery wells (RWS-4A and RWC-2), indicating the well are placed appropriately for extraction of contaminated groundwater. However, contamination in the Castle Hayne is not being recovered and treated since it is located beyond the capture zone of RWC-2. The presence of cis-1,2-DCE and vinyl chloride indicates that the PCE and TCE are degrading in the aquifers. The PCE and TCE concentrations are still higher than the daughter compounds.

Soil

The data review for soil monitoring consisted of evaluation of pre-remedial data from the Remedial Investigation dated May 1994 and data collected from the most current sampling events dated February 9-14, 2001 and January 29, 2002. On July 15, 2002, several upgrades to the SVE system were implemented. The primary system modifications were to connect two additional extraction vents and one pressure probe in the vicinity of the former septic tank pit. The data from the February 2001 and January 2002 sampling events are the most current and complete data sets available. This information was submitted to the US EPA via Technical Memo from Weston.

Table 8 presents all the pre-remedial data from the RI report. Figure 3 shows all the sampling location from the RI sampling event. Table 9 presents data from the sampling events in 2001, 2002, and various other historical sampling data. Figure 4 is a site map with all the soil sampling locations for the 2001 and 2002 sampling events. In February 2001, all 12 samples collected exceeded the PCE clean-up goal. In the January 2002 sampling event, only four samples exceeded the PCE clean-up goal. These results indicate that the SVE system continues to reduce the overall mass of VOCs in the soil. The SVE system has been operational since April 2000 and has, as of August 2002, recovered approximately 700 lbs of volatile organic compounds. Three of the four samples that were exceeding the goal were beneath the building and at depths at or greater that 10 feet. The results indicate that the bulk of the PCE contamination remains beneath the floor of the room that contained the septic tank pit. These soil sampling results are supported by the air monitoring results which indicate that the VOC concentration in the soil vapor extracted from a vent adjacent to the septic tank pit area (vent T-2) is three times greater than from any other vent.

Table 4: Surficial Aquifer Groundwater Results
OU 1 (4/92) and OU 2 (9/93) Remedial Investigations

Well	Date	Benzene	chloro-benzene	chloro-form	1,1-dichloro-ethene	1,2-DCE (total)	PCE	1,1,2-trichloro-ethane	TCE	vinyl chloride	xylenes
S1	Apr-92	<10	<10	<10	<10	<10	**10**	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	0.2J	**27**	<1	0.6J	<1	<1
S2	Apr-92	<10	<10	1J	5J	**1,200**	**880**	<10	**690**	**100**	<10
	Sep-92	0.4J	0.6J	<1	1	**466**	**490**	<1	**280**	**70**	3
S3	Apr-92	<10	<10	<10	6J	**1,200**	**5,400**	2J	**640**	**110**	<10
	Sep-92	<1	<1	<1	0.3J	**45.5**	**380**	<1	**24**	**10**	<1
S4	Apr-92	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
S5	Apr-92	<10	5J	<10	<10	<10	3J	<10	3J	2J	5J
	Sep-92	<1	<1	<1	<1	<1	<1	<1	0.8J	<1	<1
S6	Apr-92	2J	<10	<10	<10	<10	4J	<10	<10	<10	<10
	Sep-92	0.4J	<1	<1	<1	<1	0.5J	<1	0.1J	<1	<1
S7	Apr-92	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1	0.2J	<1	<1	<1	<1
S8	Apr-92	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
S9	Apr-92	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
S10	Apr-92	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
S11	Sep-92	<1	<1	3J	<1	<1	0.3J	<1	**46**	<1	<1

Concentration are in ug/l
< indicates that the material was not detected above the minimum quantitation limit
J indicates an estimated value
Bold data is greater than the remediation goals stated in the ROD, except for benzene, chloroform chlorobenzene, and xylenes which have no clean-up standard listed.

Table 5: Castle Hayne Aquifer Groundwater Results
Remedial Investigation OU 1 (4/92) and OU 2 (9/93)

Well	Date	Benzene	chloro-form	1,2-DCE (total)	PCE	TCE
C1	Apr-92	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1
C2	Apr-92	<10	2J	9J	1J	3J
	Sep-92	<1	<1	<1	<1	<1
C3	Apr-92	<10	<10	14	7J	**28**
	Sep-92	<1	<1	21	**120**	**43**
C4	Apr-92	<10	<10	<10	<10	<10
	Sep-92	<1	<1	<1	<1	<1
C5	Apr-92	**18J**	<100	<100	<100	**17J**
	Sep-92	<1	<1	<1	<1	<1
C9	Sep-92	<1	<1	<1	0.2	0.1
C10	Sep-92	<1	<1	<1	**4.8**	<1
C11	Sep-92	<1	<1	<1	0.64	<1

Concentration are in ug/l
< indicates that the material was not detected above the minimum quantitation limit
J indicates an estimated value
Bold data is greater than the remediation goals stated in the ROD,
except for benzene and chloroform which have no standard listed in the ROD.

Table 6: Summary of VOC Groundwater Analytical Results for 2002- 2003
Surficial Aquifer

Well	Date	Benzene	Chloro-form	Cyclo-hexane	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride	Total (b) VOCs
GW Goal		1.0	0.19	NS	70	70	1.0	2.8	1.0	
Surficial Wells										
S-1	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	< 0.5	<0.5	<0.5	<0.5	<0.5	0.32	<0.5	<0.5	0.32
	Mar-03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
S-2	May-02	< 10	< 10	1	180	3	340	160	24	708
	Aug-02	< 10	< 10	< 10	60	< 10	110	28	3	201
	Nov-02	<10	<10	<10	46	<10	87	19.5	3.5	138
(a)	Mar-03	<10	<10	<10	69	<10	100	49.5	6.0	224.5
S-3	May-02	< 10	< 10	< 10	4	< 10	23	2	< 10	29
	Aug-02	< 0.5	< 0.5	< 0.5	8.3	< 0.5	54	4.8	< 0.5	67.1
	Nov-02	<0.5	<0.5	<0.5	12	<0.5	60	8.3	1.9	82.2
	Mar-03	<0.5	<0.5	<0.5	8.4	<0.5	48	5.9	0.99	63.29
S-5	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	1
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.59	<0.5	<0.5	0
S-6	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	0.2
	Mar-03	<0.5	<0.5	3.5	<0.5	<0.5	<0.5	<0.1	<0.5	3.5
S-7	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.5
S-8	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
S-9	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	0.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.19
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
S-10	Jan-02	< 10	< 0.5	< 10	< 10	< 10	< 10	< 10	< 10	0
	May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	0.16	<0.5	<0.5	0.16
(a)	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
FWS-12	Jan-02	< 10	< 0.5	< 10	10	< 10	100	9	< 10	119
	May-02	< 10	< 10	< 10	9	< 10	92	9	< 10	110
	Aug-02	< 10	< 10	< 10	12	< 10	90	< 10	< 10	102
	Nov-02	<10	<10	<10	12	<10	67	8	<10	87
	Mar-03	<10	<10	<10	10	<10	96	<10	<10	106
FWS-13	Jan-02	< 10	< 0.5	< 10	< 10	< 10	1	< 10	< 10	1
	May-02	< 10	< 10	< 10	< 10	< 10	3	< 10	< 10	3
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5	< 0.5	1.2
	Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	0.51	<0.5	3.41
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	2	0.27	<0.5	2.27
RWS-1A(a)	Jan-02	< 10	< 0.5	< 10	< 10	< 10	8	< 10	< 10	8
	Nov-02	<0.5	<0.5	<0.5	0.20	<0.5	5	0.22	<0.5	5.42
	Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	6	0.11	<0.5	5.91
RWS-1	May-02	< 10	< 10	< 10	< 10	< 10	8	< 10	< 10	8
	Aug-02	< 0.5	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5	0
RWS-2A	Jan-02	< 10	< 0.5	< 10	1	< 10	17	1	< 10	19
	Aug-02	< 0.5	< 0.5	< 0.5	5.7	< 0.5	290	28	0.61	324.31
	Nov-02	<10	<10	<10	2	<10	96	2	<10	102
	Mar-03	<10	<10	<10	4	<10	170	6	<10	180
RWS-2	May-02	< 10	< 10	< 10	10	< 10	79	7	2	98
RWS-3A	Jan-02	< 10	< 0.5	6	100	1	780	240	21	1128
	May-02	< 10	< 10	< 10	48	< 10	920	93	< 10	1061
	Aug-02	< 10	< 10	4	38	< 10	970	89	4	1105
	Nov-02	<10	<10	3	46	<10	500	150	9	708
	Mar-03	<10	<10	4	27	<10	810	59	4	904
RWS-4A	Jan-02	< 10	< 0.5	< 10	54	< 10	280	35	< 10	369
	May-02	< 10	< 10	< 10	580	< 10	6900	500	93	8073
	Aug-02	1	< 10	10	310	3	3700	340	47	4411
	Nov-02	<10	<10	8	250	4	3100	280	58	3730
	Mar-03	<20	<20	2	240	3	1100	280	43	1668

See Table 7 for Notes

Table 7: Summary of VOC Groundwater Analytical Results for 2002- 2003
Castle Hayne Aquifer

Well		Date	Benzene	Chloro-form	Cyclo-hexane	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride	Total (b) VOCs
GW Goal			1.0	0.19	NS	70	70	1.0	2.8	1.0	
Castle Hayne Wells											
C-1		May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	(a)	Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
C-2		May-02	< 10	< 10	< 10	< 10	< 10	1	< 10	< 10	1
		Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
C-3		May-02	< 10	< 10	< 10	5	< 10	270	27	< 10	302
	(a)	Aug-02	< 10	< 10	< 10	5	< 10	140	23	< 10	168
		Nov-02	<10	<10	<10	5	<10	100	17	<10	122
		Mar-03	<10	<10	<10	6	<10	150	25	<10	181
C-4		Jan-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
		May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
		Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	0.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.19
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
C-5		May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
		Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
C-9		May-02	< 10	< 10	< 10	< 10	< 10	1	< 10	< 10	1
	(a)	Aug-02	< 0.5	3.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3.3
		Nov-02	<0.5	4.3	<0.5	<0.5	<0.5	0.48	<0.5	<0.5	4.78
	(a)	Mar-03	<0.5	0.105	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.105
C-10		May-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
		Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	0.16	<0.5	<0.5	0.16
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
FWC-11		Jan-02	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0
	(a)	May-02	< 10	< 10	< 10	< 10	< 10	0.5	< 10	< 10	0.5
		Aug-02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0
		Nov-02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
		Mar-03	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
C-12		Jan-02	6	< 10	2	17	< 10	15	11	<10	51
		May-02	2	< 10	3	13	< 10	7	2	< 10	27
		Aug-02	< 0.5	< 0.5	< 0.5	9.7	< 0.5	1.7	0.78	< 0.5	12.18
		Nov-02	2.3	<0.5	0.94	14	<0.5	<0.5	0.2	2.8	20.34
		Mar-03	0.75	<0.5	1.6	1.1	<0.5	<0.5	0.28	3.1	6.83
C-13		Jan-02	< 10	< 10	5	77	1	5400	390	4	5877
		May-02	< 10	< 10	< 10	53	< 10	140	13	1	207
		Aug-02	< 10	< 10	< 10	15	< 10	68	17	1	101
		Nov-02	<10	<10	<10	<10	<10	44	6	<10	50
		Mar-03	<10	<10	<10	<10	<10	6	<10	<10	6
RWC-1(a)		May-02	< 10	< 10	< 10	6	< 10	155	61	< 10	222
		Aug-02	< 10	< 10	1	16	< 0.5	360	170	< 10	547
		Nov-02	<10	<10	<10	<10	<10	29	2	<10	31
		Mar-03	<10	<10	<10	<10	<10	22	2	<10	24
RWC-2(a)		Jan-02	< 10	< 10	4	57.5	1	1350	270	18	1700.5
		May-02	< 10	< 10	1	31	< 10	1700	160	1	1893
		Aug-02	< 10	< 10	2	79	< 10	2300	190	10	2581
		Nov-02	<10	<10	<10	22	<10	2000	170	3	2195
		Mar-03	<20	<20	4	48	<20	2000	250	4	2306

Notes

Groundwater Goals are the remediation goals from the ROD, except for benzene and chloroform which are the North Carolina Groundwater Standards. No standard established for cyclohexane.

Concentrations in ug/L

(a) Average of duplicate samples.

(b) Total of VOCs listed on table only.

c - Reported as cis/trans-1,2-dichloroethene. Assumed to be cis-1,2-DCE based on historical data.

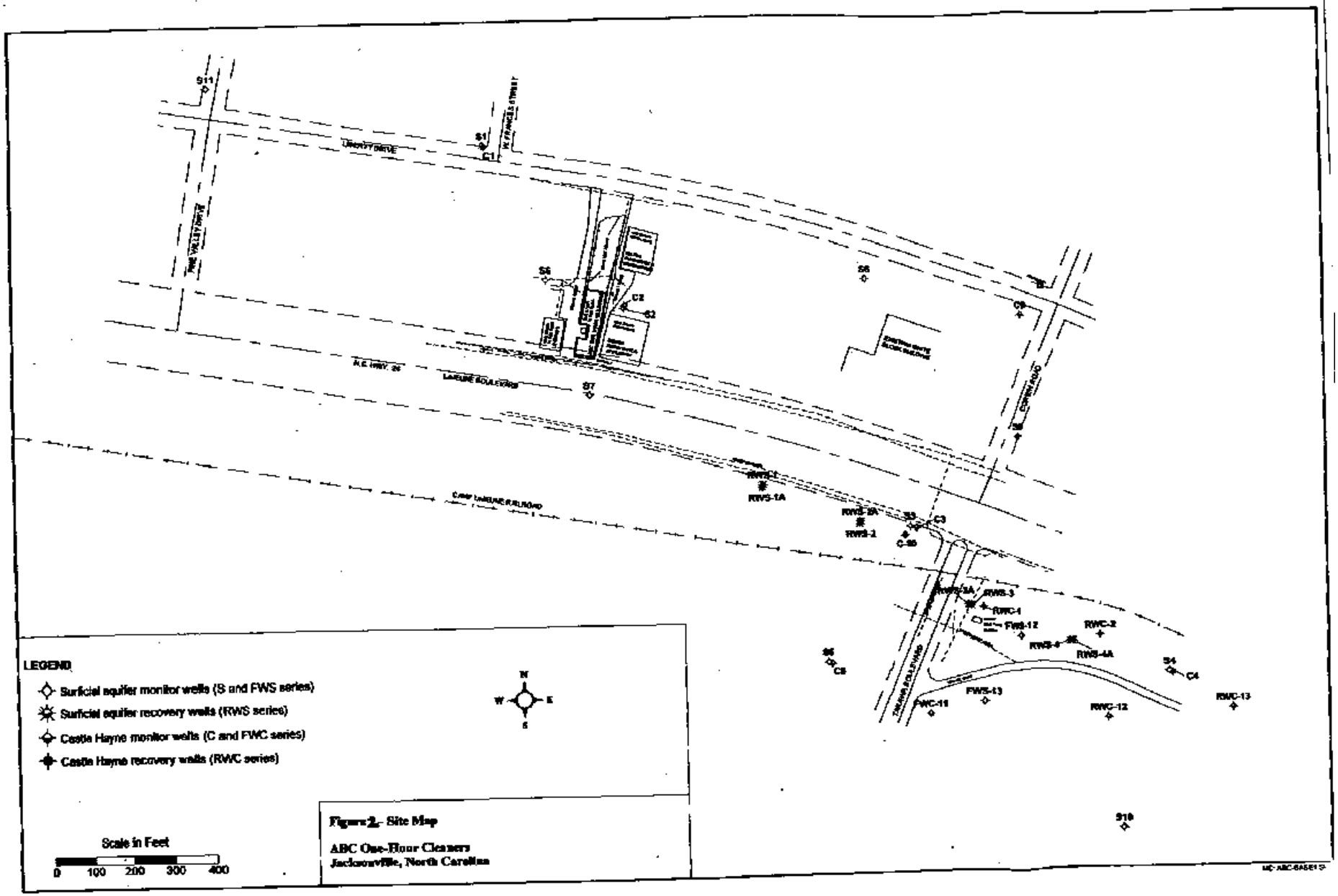


Figure 2 - Site Map

ABC One-Hour Cleaners
Jacksonville, North Carolina

Soil Sample Analysis Results Summary
Operable Unit 1(6/1991) and Operable Unit 2 (9/1993)
Concetrations reported in ug/kg or parts per billion

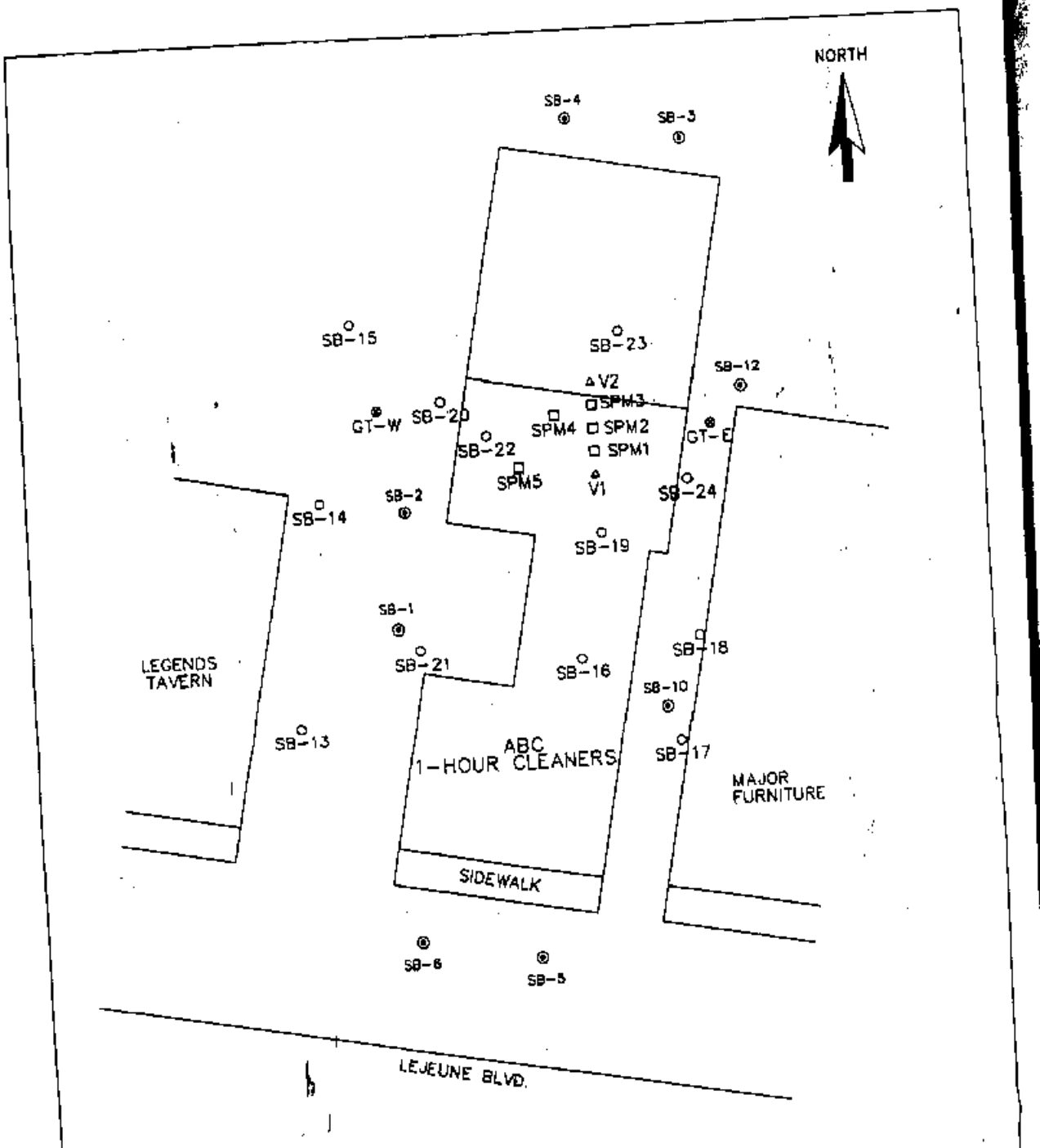
Sample Identification [1]	PCE	TCE	1,2-DCE (total)	Vinyl Chloride	Cholorform	1,1-DCE
SS-001-01-06*	640	96	98	<57	<29	<29
SS-001-01-10*	37	2J	<6	<11	<6	<6
SS-001-01-14*	440	16J	<28	<56	<28	<28
SS-002-01-02*	10	2J	<5	<11	<5	<5
SS-002-01-06*	19	72	200	42	<8	<8
SS-002-01-10*	27J	110	730	55J	<30	<30
SS-002-01-14*	<740	<740	1,800	<1,500	<740	<740
SS-014-01-00	90	<11	<11	<11	<11	<11
SS-014-01-05	570	19	20	<11	<11	<11
SS-014-01-10	210	12	<12	<12	<12	<12
SS-015-01-00	20	<11	<11	<11	<11	<11
SS-015-02-04	<13	<13	17	<13	<13	<13
SS-016-01-2	48,000	2,500J	400J	<12	17	<12
SS-016-02-5	27,000	920J	150	<12	10J	<12
SS-016-03-10	200	20	50	<12	<12	<12
SS-016-04-15	390	28	22	<11	<11	<11
SS-017-01-2	14	<11	<11	<11	<11	<11
SS-017-02-5	1,400J	200	290J	<12	<12	<12
SS-017-03-10	650	130	330	<54	<54	<54
SS-017-04-15	1,400J	110	210	<62	<62	<62
SS-018-01-02	830,000	<43,000	<43,000	<43,000	<43,000	<43,000
SS-018-01-02A	2,100,000	33,000	<31,000	<31,000	<31,000	<31,000
SS-018-02-05	110,000	260,000	110,000	<16,000	<16,000	<16,000
SS-019-01-02	12,000	11,000	4,300	<1,300	<1,300	<1,300
SS-019-02-02A	300,000	120,000	<47,000	<47,000	<47,000	<47,000
SS-019-02-05	4,900	1,400	3,100	190	<12	<12
SS-019-03-09	16	<12	<12	<12	<12	<12
SS-019-04-15	5,100	<1,400	840J	<1,400	<1,400	<1,400
SS-020-01-00	170	14	<11	<11	<11	<11
SS-021-01-00A	94	14	<11	<11	<11	<11
SS-022-01-02	580,000	15,000	720	<7,000	<7,000	<7,000
SS-022-01-02A	790,000	<130,000	<130,000	<130,000	<130,000	<130,000
SS-022-02-05	12,000	1,000J	2,400	<1,500	<1,500	<1,500
SS-022-03-10	26,000	1,700	3,700	<1,500	<1,500	<1,500
SS-022-04-15	2,900	<1,400	670J	<1,400	<1,400	<1,400
SS-023-01-02	410,000J	3,600J	85J	<14	<14	<14
SS-023-02-05	120	22	12J	<12	<12	<12
SS-023-03-10	20	14	37	<13	<13	<13
SS-023-04-15	44	95	180	<12	<12	<12
SS-SPM1-01-00	49,000	1,000J	940J	<1,400	<1,400	<1,400
SS-SPM1-02-05	7,500	790J	1,500	<1,400	<1,400	<1,400
SS-SPM1-03-10	7,100	530J	1,200J	<1,400	<1,400	<1,400
SS-SPM1-04-14	8,900	780J	1,800	<1,400	<1,400	<1,400
SS-SPM2-01-00	4,400	730J	900J	<1,300	<1,300	<1,300
SS-SPM2-02-05	11,000	1,600	2,300	<1,400	<1,400	<1,400
SS-SPM2-02-05A	14,000	2,200	3,100	<1,500	<1,500	<1,500
SS-SPM2-03-10	15,000	1,500	2,000	<26	<27	<27
SS-SPM2-04-15	6,000	<1,400	<1,400	<1,400	<1,400	<1,400
SS-SPM5-01-00	43,000	<2,500	<2,500	<2,500	<2,500	<2,500
SS-SPM5-02-05	11,000	<12	5,100	79	<12	<12
SS-SPM5-03-10	3,000	<1,400	<1,400	<1,400	<1,400	<1,400
SS-SPM5-04-15	13,000	<1,300	990J	<1,300	<1,300	<1,300
SS-V1-01-10	33,000	810J	1200J	<1,400	<1,400	<1,400
SS-V1-02-14	47,000	1,700	3,000	<1,400	<1,400	<1,400
SS-V1-02-14A	180,000	1,100J	<1,400	<1,400	<1,400	<1,400
SS-V2-01-02	180,000J	36,000J	20,000J	<20	<20	<20
SS-V2-02-05	5,400J	510	370	<39	<39	<39

[1] Table contains samples that have compounds above the quantitation limit. Therefore, some samples were omitted from the table.

* OU 1 samples collected June 1991. Key: SS-001-01-06 is soil sample; soil boring number; OU 1; sample collection depth.
Otherwise, SS-022-03-10 is soil sample; soil boring number; sample interval; sample collection depth.

J- estimated value

< not detected above quantitation limit



LEGEND

▲ V#	SOIL VAPOR EXTRACTION BORING LOCATIONS
□ SPM#	SOIL PRESSURE MONITOR BORING LOCATIONS
○ SB-##	OU-2 SOIL BORING LOCATIONS
⊛ GT-E	GEOTECHNICAL BORING LOCATIONS
◉ SB-##	OU-1 SOIL BORING LOCATIONS

0 5 25 50

SCALE IN FEET

WESTON

FIGURE	3
DATE	10/25/93
REVISION	0
DRAWN BY	J.C., W.M.
FILE	04400-XX.DWG

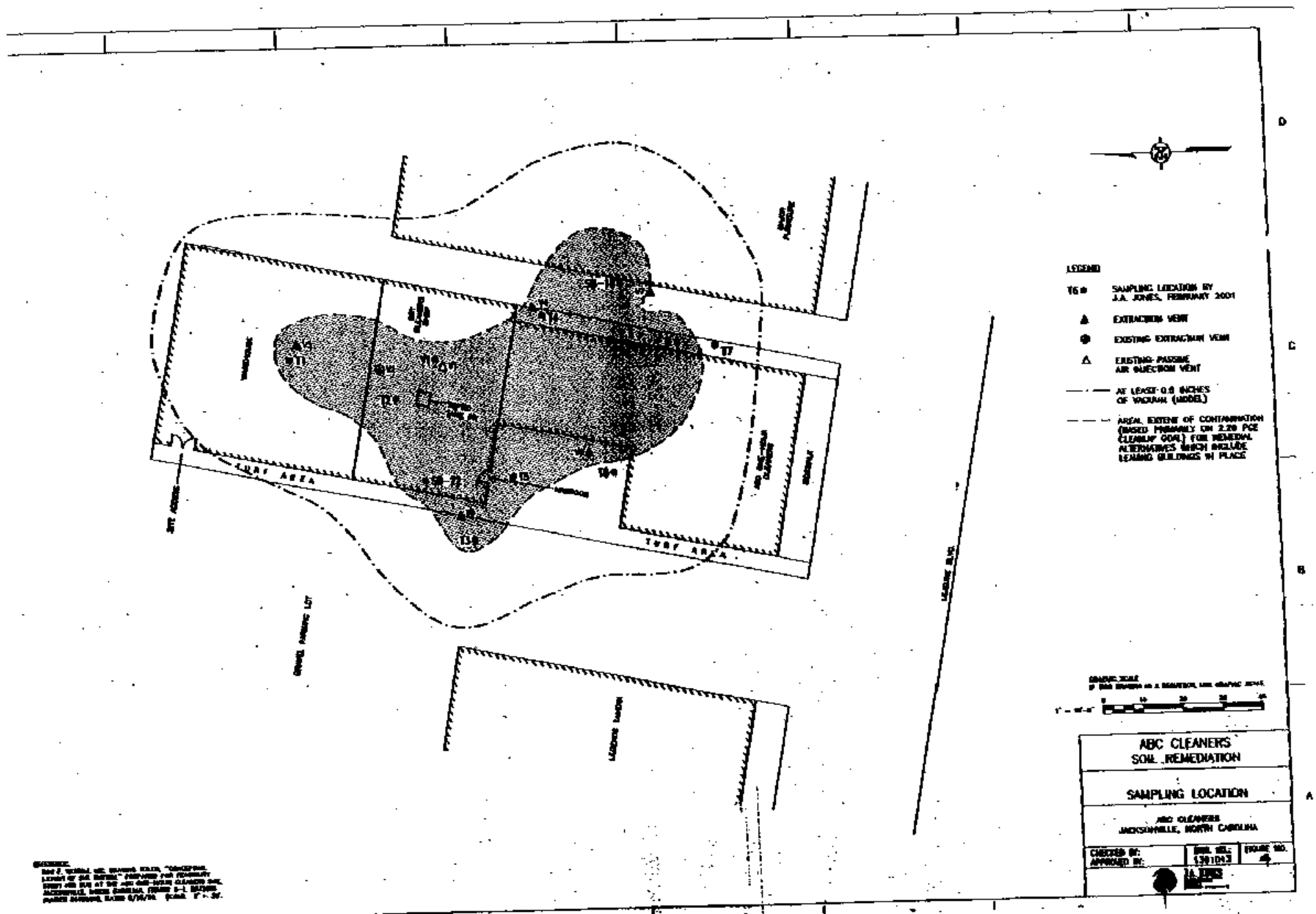
SOIL BORING LOCATIONS

REMEDIAL INVESTIGATION FOR THE ABC ONE-HOUR CLEANERS SITE JACKSONVILLE, NORTH CAROLINA

Table 9: Summary of the Soil Sampling Analytical Results
from February 2001, January 2002,
Various Other Historical Data

Soil Boring	Depth (ft)	Chemical	Remedial Goal	Feb. 2001 Result	Jan. 2002 Result	Historical Results	
SB-18	1	PCE	2.16	NS	1.5	830 / 2,100	Collected from SB-18, 1' Depth, 1993
	1	TCE	0.90	NS	0.03	33	
	1	DCE	21.0	NS	0.24	< 31	
	2	PCE	2.16	65	0.1	NS	See results listed above
	2	TCE	0.90	7.4	0.015	NS	
	2	DCE	21.0	< 0.0068	~0.013	NS	
	4	PCE	2.16	33	NS	110	Collected from SB-18, 5' Depth, 1993
	4	TCE	0.90	5.1	NS	260	
	4	DCE	21.0	< 0.0046	NS	110	
SB-22	2	PCE	2.16	72	0.021	790 / 580	Collected from SB-22, 2' Depth, 1993
	2	TCE	0.9	40	ND	15	
	2	DCE	21.0	< 0.52	ND	0.72	
	15	PCE	2.16	2.8	5.5	2.9	Collected from SB-22, 15' Depth, 1993
	15	TCE	0.9	< 0.49	0.2	<1.4	
	15	DCE	21.0	< 0.49	0.2178	0.67	
T-2	6	PCE	2.16	170	0.06	5.4	Collected from V-2 (~6 NE), 5' Depth, 1993
	6	TCE	0.9	<0.55	ND	0.51	
	6	DCE	21.0	<0.55	ND	0.37	
	10	PCE	2.16	8,300	7,100	2.3 / 0.58	Collected from V-2 (~6 NE), 10' Depth, 1993
	10	TCE	0.9	21	ND	0.091 / 0.11	
	10	DCE	21.0	<0.49	ND	0.083 / 0.095	
T-3	3	PCE	2.16	3,500	0.97	0.01	Collected from SB-2 (~5' W.), 2' Depth, 1991
	3	TCE	0.9	61	0.11	0.002J	
	3	DCE	21.0	<0.0051	0.031	<0.005	
T-4	20	PCE	2.16	660	3.6		No adjacent historical samples
	20	TCE	0.9	9	0.03		
	20	DCE	21.0	< 0.0053	0.013		
T-5	2	PCE	2.16	7.5	0.14		No adjacent historical samples
	2	TCE	0.9	2.9	0.019		
	2	DCE	21.0	<0.500	0.012		
T-6	4	PCE	2.16	10	ND		No adjacent historical samples
	4	TCE	0.9	0.076	ND		
	4	DCE	21.0	0.0052	ND		
T-7	6	PCE	2.16	2.4	ND	1.4	Collected from SB-17 (~10' E.), 5' Depth, 1993
	6	TCE	0.9	0.0097	ND	0.2	
	6	DCE	21.0	<0.0064	ND	0.29	
V-1	2	PCE	2.16	5,200	52	49	Collected from SPM1 (~7' N.), 2' Depth, 1993
	2	TCE	0.9	130	0.088	1	
	2	DCE	21.0	<0.650	0.045	0.94	

Concentrations in mg/kg


LEGEND
SAMPLING LOCATION BY J.A. JONES, FEBRUARY 2001
EXTRACTION VENT
EXISTING EXTRACTION VENT
EXISTING PASSIVE AIR INJECTION VENT
AT LEAST 0.8 INCHES OF VACUUM (MODEL)
AREAL EXTENT OF CONTAMINATION (BASED PRIMARILY ON 2.20 PCE CLEANUP GOAL) FOR REMEDIAL ALTERNATIVES WHICH INCLUDE LEAVING BUILDINGS IN PLACE
ABC CLEANERS
SOIL REMEDIATION
SAMPLING LOCATION
ABC CLEANERS
JACKSONVILLE, NORTH CAROLINA
CHECKED BY:
APPROVED BY:
DWG. NO.: 1301013
FIGURE NO. 4
J.A. JONES
REAR AREA
FRONT AREA
RAMP PARKING LOT
LEGEND

5.6 Site Inspection

The site inspection of the ABC Cleaners site was conducted on May 5, 2003. Attending the site visit were:

- Daniel Hockett, Terraine Project Manger (Weston subcontractor for OU 1), Charlotte, NC Office
- Jim Tan, J. A. Jones, Project Manager (Weston subcontractor for OU 2), Cherry Point, NC Office
- Regina Berry, J. A. Jones, Technical Assistant, Cherry Point, NC Office

NC DENR staff met on site to inspect the remediation systems, areas surrounding the systems for security and safety, and interview the subcontractors operating the systems. The groundwater pump and treat system is located on the USMC Camp Lejeune property. The system is located within a utility house and is secure. Daniel Hockett was the project manager for this system. He gave a complete overview of the system and of the monitoring and extraction wells. During the visit, it was noted that an alarm within the building was sounding. Mr. Hockett stated that the alarm light had been staying on in the control panel since Terraine began operations at the site. This light referred to the bag filter system actuator which was originally designed to direct flow to either one of two parallel filters based on the pressure differential. However, the system has not been operated in this mode (the pressure differential meter had been disconnected by Foster Wheeler). Therefore, this error message was meaningless. The PLC has been reprogrammed such that the valve directing the flow is not monitored by the PLC. The valve has been positioned to split the flow equally between the two filters. Also inside the building was a leak from the discharge pump and possibly leaking to the outside of the building. Water stains were visible on the foundation of the building. It was also noted that one empty 55-gallon drum, eight 55-gallon drums with Feremede, one 25-gallon drum with calsparce, an air stripper tray, and piping were located adjacent to and behind the building. The location of all the monitoring wells were observed and appeared to be secure. Mr. Hockett then pointed out that the wells labeled C-4 and S-4 are mislabeled, based on conflicting information on the well tag and the actual well depths gathered during a recent sampling event. Mr. Hockett also stated that for the weekly inspections, replacement of filters, and emergency response, Eastern Environmental Operators from Vanceboro, NC were subcontracted by Terraine. After the visit/walk-through with Terraine, Mr. Hockett began to sample the wells for environmental monitoring requirements. Since the site inspection most of the above-mentioned issues have been addressed.

The second meeting during the site visit was to inspect the SVE system operated by J. A. Jones. Jim Tan (project manager) and Regina Berry (technical assistant) were present for the visit. NC DENR staff had several questions regarding the system operations, sampling and monitoring procedures, and emergency response activities. Several of the questions were unknown by the J. A. Jones staff , especially regarding the operations of the system and emergency response activities. We were referred to Wade

Lewis, former operator and project manager for the site, for these answers. While on the ABC property, it was noted that the SVE system was secure, the building was locked, and the extraction wells were bolted and secure.

5.7 Interviews

The following persons were interviewed regarding the activities and implementation of the remedial actions at the ABC One Hour Cleaners site:

Mr. Luis Flores, Remedial Project Manager, US EPA Region IV:

Mr. Flores stated in his email that this is a statutory review not a policy five-year review. The reason for this being a statutory review is because contaminated soil will be left on the property and that the use of the property will be restricted for this reason. He stated that the building needs to remain on site to keep soil from leaching, as explained in the ROD. Therefore, institutional controls need to be implemented. He also stated based on the most recent groundwater data, it appears that the groundwater pump and treat system is not containing the entire plume and the contamination may have migrated beyond the extraction wells. Mr. Flores stated that there are no groundwater users downgradient of the contaminated plume.

Mr. Brian McGee, Project Manager, Weston:

Mr. McGee, regarding the groundwater remediation, stated that he had recommended remediating at least part of the plume using in situ bioremediation with hydrogen release compounds. But if the concentrations continue to lower and no downgradient receptors would be impacted then monitored natural attenuation (MNA) would also be worth a closer look.

Several interviews were conducted while visiting the site on May 5, 2003. As stated previously, Daniel Hockett (Terraine, project manager), Jim Tan (J. A. Jones, project manager), and Regina Berry (J. A. Jones, technical assistant) were interviewed regarding the status, sampling and monitoring, and performance of the remediation systems. These interviews brought up several issues with each system but most importantly the issue of an emergency response procedure and contacts for immediate action, if needed.

6.0 Technical Assistance

6.1 *Question A: Is the remedy functioning as intended by the decision documents?*

Groundwater

The remedial action continues to be operating as designed. However, one of the remedial action objective (RAO) is to restore the surficial and Castle Hayne aquifers to its

beneficial use (ie: for drinking water). Based on recent groundwater data from Weston's Groundwater Sampling results dated November 2002, several conclusions were drawn: VOC plume appears to be elongating to the east-southeast in both aquifers, plume appears to have migrated further into the Castle Hayne than in the surficial aquifer, analytical data shows that the recovery wells are placed in appropriate locations due to the highest concentrations of VOC, and presence of cis-1,2-DCE and vinyl chloride indicating that PCE and TCE are readily degrading (although PCE and TCE are still higher than daughter products).

The remedy, being groundwater recovery by extraction wells and treatment by air stripping, may not be containing the entire contaminated plume and preventing the migration of site contaminants at this time. Although the frequent equipment breakdowns and other past operator issues have caused the remediation system to be out of service for years at a time. A formal review should be conducted for optimizing the remedial systems for groundwater. There are no groundwater receptors downgradient from the site.

Implementation of institutional controls recommended by the ROD have not occurred to date. The ROD states that institutional controls will be placed on well construction and water use in the general area of the site. This matter is discussed further in the Issues and Recommendations section of this review.

Soil

The remedial action objectives (RAOs) for soils were developed to prevent direct contact exposure to soils containing levels of contaminants that produce unacceptable risk levels and prevent migration of contamination from soil to groundwater. The soil clean-up goals, as stated in the ROD, are based on the buildings/structures to remain present and intact on the property as a protective barrier from the soil contamination and to decrease leaching into the groundwater. To date, no institutional controls have been implemented.

6.2 *Question B: Are the exposure assumptions, toxicity data, clean-up levels and remedial action objectives (RAOs) used at the time of the remedy still valid?*

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. However, as stated previously in Section 5.4, analytical capabilities have changed since the ROD for OU1 was prepared. Most significantly, quantitation limits in most cases are lower than the ROD clean-up levels. It is now technically possible to obtain lower quantitation limits in water samples for two site specific compounds, PCE and vinyl chloride. At the time of the ROD, the quantitation limits for PCE and vinyl chloride were 1 ug/l. This limit of 1 ug/l was then specified in the ROD as the clean-up goals in groundwater for PCE and vinyl chloride. Currently, the quantitation limits for PCE and vinyl chloride are 0.5 ug/l. The NC Groundwater Standard, as stated in the NC Drinking Water and Groundwater Standards; Groundwater Classifications and

Standards (NCAC Title 15 Chapter 2L), is 0.7 ug/l for PCE and 0.015 ug/l for vinyl chloride. Therefore, clean-up goals of 0.7 ug/l for PCE and 0.5 ug/l for vinyl chloride would be changed to reflect these new values.

6.3 *Question C: Has any other information come to light that could call into question the protectiveness of the remedy?*

No additional information has come to light that could call into question the protectiveness of the remedy.

6.4 Technical Assessment Summary

The most significant issues regarding the protectiveness of the remedy are whether the groundwater extraction system is containing and capturing the contaminant in the most efficient manner; the lack of institutional controls; and the clean-up goals reflecting the new quantitation limit for PCE and vinyl chloride.

7.0 Issues

There are several issues/problems that have been identified during this review. Each is discussed further in the recommendation section of this report.

- Implementation of institutional controls as stated in the RODs.
- Groundwater contamination in the surficial and Castle Hayne aquifers may not be contained. It is not clear that the zone of influence of the recovery wells is capturing downgradient contamination.
- The extent of contamination needs to be investigated in the Castle Hayne aquifer. The concentration of PCE in C-13, the furthest down gradient well, is above the cleanup goal.
- It is now technically possible to obtain lower quantitation limits in water samples for two site specific compounds, PCE and vinyl chloride. Therefore, clean-up goals of 0.7 ug/l for PCE and 0.5 ug/l for vinyl chloride would be changed to reflect these new values.
- The leak in the groundwater treatment building needs to be fixed. Treated groundwater is leaking from a pipe near the air stripper trays. The leaking water is not released around the building but is collected by a sump area and pumped back into the holding tank for retreatment.
- An evaluation of a possible release of water is needed around the groundwater treatment building. Staining was observed at the bottom of the treatment building.

- The aesthetics of the area surrounding the groundwater treatment building need to be addressed. Nine drums, an air stripper tray, and unused piping were observed around the outside of the building.

- Soil monitoring needs to be more routine. Sampling of the soil needs to be performed on a more routine basis to determine the success of the soil venting extraction system.

8.0 Recommendations and Follow-up Actions

Table 10: Recommendations and Follow-up Actions

Issues	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Institutional controls for the site as proposed in the RODs have not been implemented.	Implement institutional controls and review implementation in next five-year review	EPA & State	EPA & State	Before next five-year review	N	N
Groundwater contamination in the surficial and Castle Hayne aquifers may not be contained.	A formal review should be conducted for optimizing the remedial systems for groundwater.	EPA & State	EPA & State	Before next five-year review	N	Y
Extent of contamination needs to be investigated in the Castle Hayne Aquifer.	More groundwater investigation is needed in the Castle Hayne Aquifer.	EPA & State	EPA & State	Before next five-year review	N	Y
Groundwater clean-up goals should reflect new lower quantitation limits	ROD needs to be modified to reflect new goals.	EPA & State	EPA & State	Before next five-year review	N	N
Treated groundwater is leaking from a pipe near the air stripper trays.	Leak in the groundwater treatment building needs to be fixed.	EPA	EPA	2003	N	N
Staining observed at the bottom of the treatment building.	Evaluation of a possible release of water is needed around the groundwater treatment building.	EPA	EPA	2003	N	N
Aesthetics of the area surrounding the groundwater treatment system need to be addressed.	Housekeeping practices around the treatment buildings need to be kept up continuously.	EPA	EPA	2003	N	N
Soil Monitoring needs to be more routine to determine the success of the soil venting extraction system.	Scheduled sampling needs to be developed for soil monitoring.	EPA & State	EPA & State	Before next five-year review	N	N

9.0 Protectiveness Statement

The remedies at OU1 and OU 2 currently protect human health and the environment in the short-term because the main source of contamination is being remediated through the soil vapor extraction system and currently no human exposure pathways exist to contaminated soil or groundwater. However, in order for the remedies to be protective in the long-term, the following actions need to be taken to ensure long-term protectiveness: Implementation of Institutional Controls as stated in the RODs; A formal review should be conducted for optimizing the remedial systems for groundwater; and Further groundwater investigation of the Castle Hayne Aquifer.

10.0 Next Review

The next Five-Year Review for the ABC One-Hour Cleaners site is scheduled for August 2008, five years from the date of this review.

ATTACHMENT 1

List of Documents Reviewed
ABC One Hour Cleaners Five-Year Review

Roy F. Weston, Inc. November 1992. Remedial Investigation Report, Revision 1, ABC One Hour Cleaners, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. January 28, 1993. Record Of Decision, Operable Unit #1: Groundwater, ABC One Hour Cleaners Site, Jacksonville, North Carolina.

Roy F. Weston, Inc. May 1994 Remedial Investigation Report, Revision 1, ABC One Hour Cleaners, Operable Unit 2, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. July 7, 1994. Draft Performance Remedial Deign (RD), ABC One Hour Cleaners Site, Operable Unit 1- Groundwater, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. September 7, 1994 Signed Record Of Decision, ABC One Hour Cleaners Site Operable Unit 2 (OU2)- Soil, Jacksonville, North Carolina.

Roy F. Weston, Inc. October 1994. Work Plan Remedial Design/Solicitation Package Project Assistance, Revision 0, Volume 1-Technical. ABC One Hour Cleaners, Operable Unit 2, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. May 17, 1995.Performance Specs Remedial Design (RD), ABC One Hour Cleaners Site Operable Unit 2 (OU2)- Soils, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. April 1991 through January 1998. Fact Sheet Updates, ABC One Hour Cleaners Superfund Site, Jacksonville, Onslow County, North Carolina.

Roy F. Weston, Inc. March 2001. Mixing Analysis for Proposed NPDES Permit Modification. ABC One Hour Cleaners, Jacksonville, North Carolina.

Roy F. Weston, Inc. May 2002. Interim Remedial Action Report. ABC One Hour Cleaners, Operable Unit 1 Groundwater Remediation, Jacksonville, North Carolina.

U. S. Environmental Protection Agency, Region IV. July 2002. Superfund Preliminary

Close-Out Report, ABC One Hour Cleaners Superfund Site, Jacksonville, Onslow County, North Carolina.

Roy F. Weston, Inc. February 3, 2003. ABC One-Hour Cleaners Groundwater Sampling Results-November 2002.

Roy F. Weston, Inc. May 2000.through November 2002. ABC Cleaners Weekly Update (email).

ATTACHMENT 2

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Daniel Hockett	O & M Project Manager	Terraine	May 5, 2003
Jim Tan	O & M Project Manager	J. A. Jones	May 5, 2003
Regina Berry	Technical Assistant	J. A. Jones	May 5, 2003

INTERVIEW RECORD

Site Name: ABC One Hour Cleaners		**EPA ID No.:**NCD 024644494
Subject: Site Inspection for 5-Year Review	**Time:** 1200	**Date:** 5/5/03
Type: □ Telephone ☒ Visit □ Other **Location of Visit:** Groundwater Treatment System		

Contact Made By:

Name: Nile Testerman	**Title:** Env. Engineer	**Organization:** NC DENR

Individual Contacted:

Name: Daniel Hockett	**Title:** O & M Project Manager	**Organization:** Terraine
Telephone No: (704) 889-0004 **Fax No:** (305) 513-4902 **E-Mail Address:** dhockett@terraine.com	**Street Address:** 600 Towne Centre, Suite 308 **City, State, Zip:** Pineville, NC 28134	

Summary Of Conversation

See report and checklist for the summary of the site visit.

Site Inspection Checklist

I. SITE INFORMATION	
Site name: ABC One Hour Cleaners- OU 1	**Date of inspection:** May 5, 2003
Location and Region: Jacksonville, Onslow County, NC; Region IV	**EPA ID:** NCD 024644494
Agency, office, or company leading the five-year review: NC DENR, Superfund Section	**Weather/temperature:** overcast and mild

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other_____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached* ☐ Site map attached* *See Report

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Brian McGee (Name) Weston, Project Manager (Title) May 5, 2003 (Date)
   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. (610) 701-3097
   Problems, suggestions; ☒ Report attached _____

2. **O&M staff** Daniel Hockett (Name) Terraine, O&M Project Manager (Title) May 5, 2003 (Date)
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. (704) 889-0004
   Problems, suggestions; ☒ Report attached _____

Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☒ Report attached.

US EPA conducted the community interviews for the site. See report.

Additional interviews were conducted for OU 2 (soil). These findings are located in the following check list.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☐ N/A
	☒ Effluent discharge	☒ Readily available	☒ Up to date	☐ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☐ N/A
	☐ Other permits _____	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A
	Remarks Did not have document on site but data is readily available			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☐ N/A
	☒ Water (effluent)	☒ Readily available	☒ Up to date	☐ N/A
	Remarks Sampled in March and April but data not yet available.			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other Terraine is a subcontractor for Weston (EPA contractor). Terraine has also subcontracted Eastern Environmental Operators for weekly system inspections.

2. **O&M Cost Records**
☒ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate $2,262,900 ☐ Breakdown attached

Total annual cost by year for review period if available

From ________ To ________ ________ ☐ Breakdown attached
Date Date Total cost
From ________ To ________ ________ ☐ Breakdown attached
Date Date Total cost
From ________ To ________ ________ ☐ Breakdown attached
Date Date Total cost
From ________ To ________ ________ ☐ Breakdown attached
Date Date Total cost
From ________ To ________ ________ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: ________

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks ________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks ________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☒ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☐ N/A

Other problems or suggestions: ☐ Report attached

_____

_____

_____

_____

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks _____

_____

_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks _____

_____

2. **Land use changes on site** ☒ N/A

Remarks _____

_____

3. **Land use changes off site** ☒ N/A

Remarks _____

_____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☒ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks See report

B. Other Site Conditions

Remarks The aesthetics of the area surrounding the groundwater treatment building need to be addressed. Nine drums, an air stripper tray, and unused piping were observed around the outside of the building.

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks_____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☒ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☒ Air stripping ☒ Carbon adsorbers
   ☒ Filters Particulate filters
   ☐ Additive (*e.g.*, chelation agent, flocculent)
   ☐ Others
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually
   ☐ Quantity of surface water treated annually
   Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☒ Good condition ☐ Needs Maintenance
   Remarks

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☒ Needs Maintenance
   Remarks Leaks and plumbing need attention

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☒ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks Water staining near foundation and leak inside building

6. **Monitoring Wells** (pump and treatment remedy)
   ☒ secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☒ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks However, wells S-4 and C-4 are mislabeled

D. Monitoring Data

1. Monitoring Data
   ☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining in some wells

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See text of five-year report

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

See text of five-year report

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

See text of five-year report

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

See text of five-year report

INTERVIEW RECORD

Site Name: ABC One Hour Cleaners		**EPA ID No.:**NCD 024644494
Subject: Site Inspection for 5-Year Review	**Time:** 1400	**Date:** 5/5/03
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:** ABC One Hour Cleaners		

Contact Made By:

Name: Nile Testerman	**Title:** Env. Engineer	**Organization:** NC DENR

Individual Contacted:

Name: Jim Tan Regina Bery	**Title:** O & M Project Manager Technical Assistant	**Organization:** J. A. Jones Environmental Services
Telephone No: (252) 466-9455 **Fax No:** **E-Mail Address:**	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

See report and checklist for the summary of the site visit.

Site Inspection Checklist

I. SITE INFORMATION

Site name: ABC One Hour Cleaners- OU 2	**Date of inspection:** May 5, 2003
Location and Region: Jacksonville, Onslow County, NC; Region IV	**EPA ID:** NCD 024644494
Agency, office, or company leading the five-year review: NC DENR, Superfund Section	**Weather/temperature:** overcast and mild

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other Soil Vapor Extraction System

Attachments: ☐ Inspection team roster attached* ☐ Site map attached* *See Report

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Brian McGee (Name) Weston, Project Manager (Title) May 5, 2003 (Date)

   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. (610) 701-3097

   Problems, suggestions; ☒ Report attached

2. **O&M staff** Jim Tan (Name) J. A. Jones, O&M Project Manager (Title) May 5, 2003 (Date)

   Regina Barry (Name) J. A. Jones, Technical Assistant (Title) May 5, 2003 (Date)

   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. (252)466-9455

   Problems, suggestions; ☒ Report attached

Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☒ Report attached.

US EPA conducted the community interviews for the site. See report.

Additional interviews were conducted for OU 1 (groundwater). These findings are located in the previous check list.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other J. A. Jones is a subcontractor for Weston (EPA contractor). However, operators of the system may change and Wade Lewis, the previous operator, would take over O & M.

2. **O&M Cost Records**

☒ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate $521,463 ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☒ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☐ N/A

Other problems or suggestions: ☐ Report attached

_____

_____

_____

_____

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks _____

_____

_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks _____

_____

2. **Land use changes on site** ☒ N/A

Remarks _____

_____

3. **Land use changes off site** ☒ N/A

Remarks _____

_____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☒ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks See report

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks_____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters _____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually_____
   ☐ Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks _____

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   ☐ secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   ☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining in some wells

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____

X. OTHER REMEDIES

SOIL REMEDIES ☒ Applicable ☐ N/A

A. Soil Vapor Extraction System ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks SVE system

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   - ☐ Metals removal
   - ☐ Oil/water separation
   - ☐ Bioremediation
   - ☐ Air stripping
   - ☒ Carbon adsorbers
   - ☐ Filters _____
   - ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   - ☒ Others Mini-cyclone
   - ☐ Good condition
   - ☐ Needs Maintenance
   - ☐ Sampling ports properly marked and functional
   - ☐ Sampling/maintenance log displayed and up to date
   - ☐ Equipment properly identified
   - ☐ Quantity of groundwater treated annually_____
   - ☐ Quantity of surface water treated annually_____

   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   - ☐ N/A
   - ☒ Good condition
   - ☐ Needs Maintenance

   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   - ☐ N/A
   - ☒ Good condition
   - ☐ Proper secondary containment
   - ☐ Needs Maintenance

   Remarks_____

4. **Discharge Structure and Appurtenances**
   - ☐ N/A
   - ☒ Good condition
   - ☐ Needs Maintenance

   Remarks _____

5. **Treatment Building(s)**
   - ☒ N/A
   - ☐ Good condition (esp. roof and doorways)
   - ☐ Needs repair
   - ☐ Chemicals and equipment properly stored

   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   - ☒ secured/locked
   - ☒ Functioning
   - ☒ Routinely sampled
   - ☒ Good condition
   - ☒ All required wells located
   - ☐ Needs Maintenance
   - ☐ N/A

   Remarks_____

D. Monitoring Data

3. Monitoring Data
   - ☒ Is routinely submitted on time
   - ☒ Is of acceptable quality

4. Monitoring data suggests:
   - ☒ Groundwater plume is effectively contained
   - ☒ Contaminant concentrations are declining in some wells

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See text of five-year report

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

See text of five-year report

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

See text of five-year report

D. Opportunities for Optimization

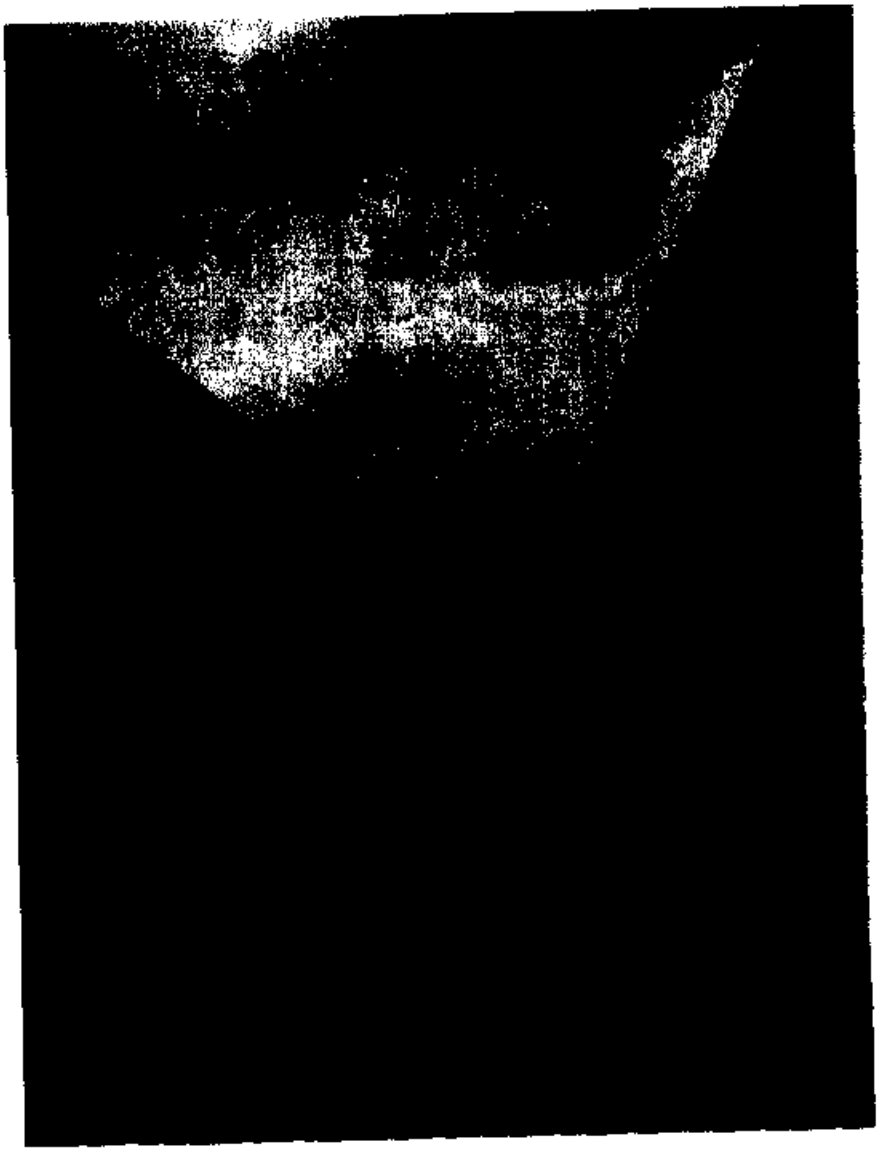
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

See text of five-year report

ATTACHMENT 3

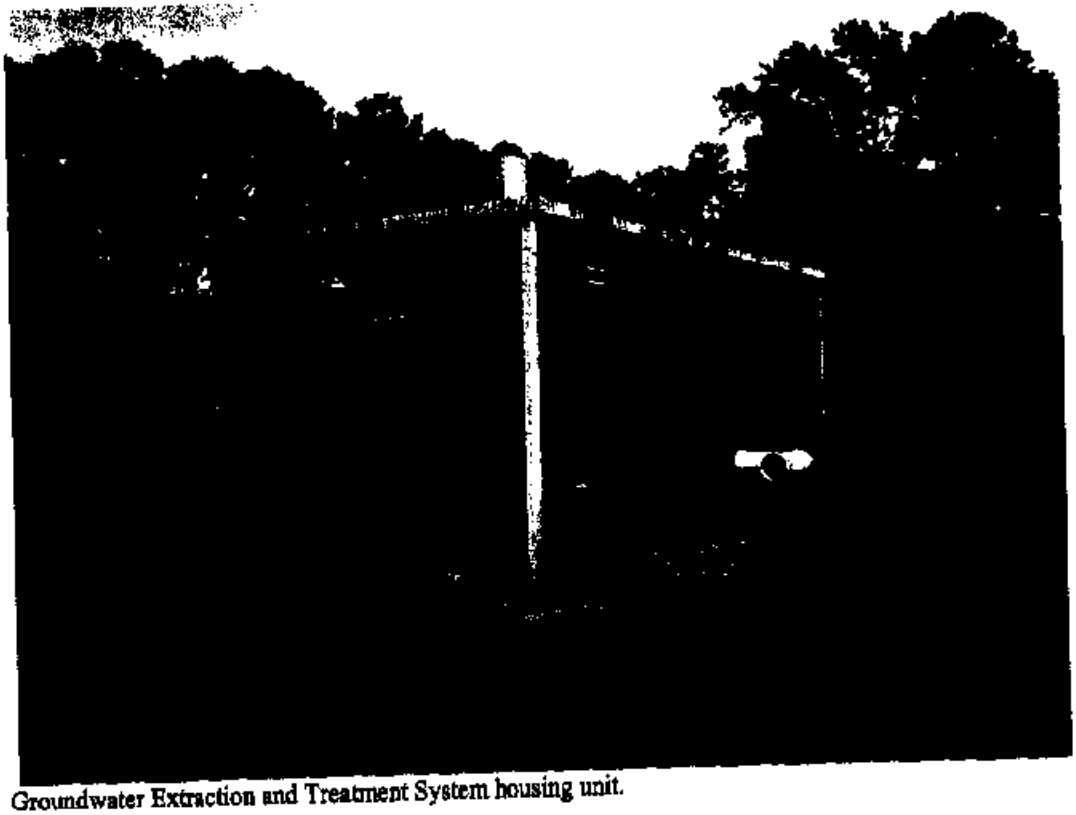
Entrance to the ABC One Hour Cleaners operation.

A side view of the building.

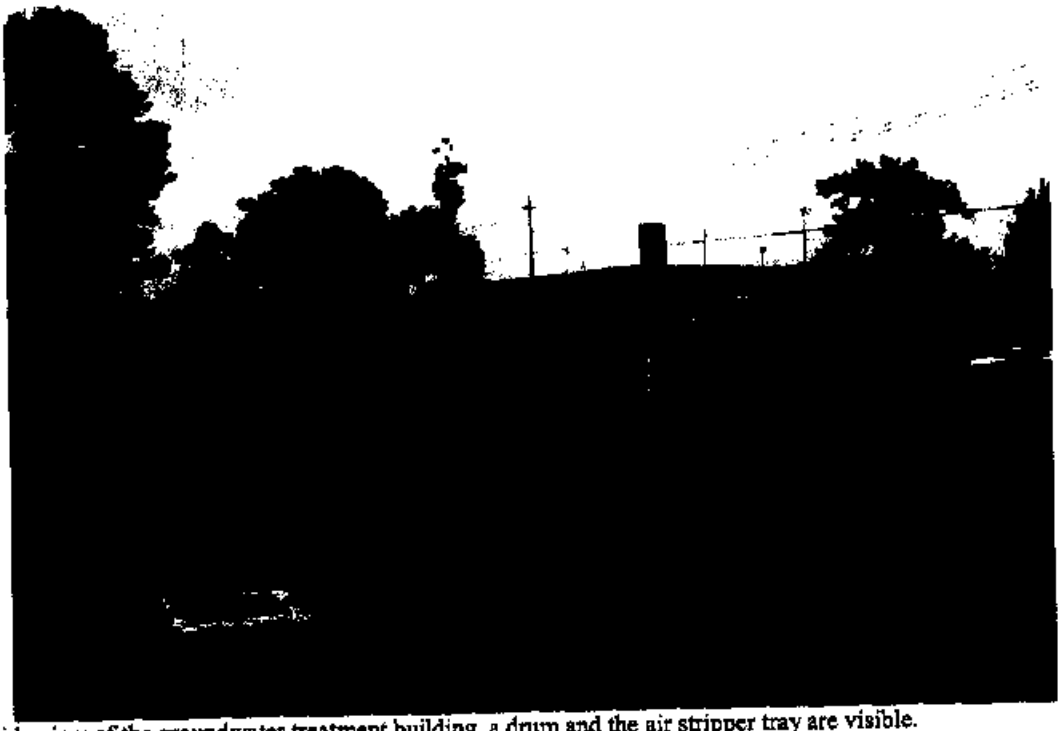


Side of the ABC One Hour Cleaner building. This is the location of the well and entrance to the SVE system.

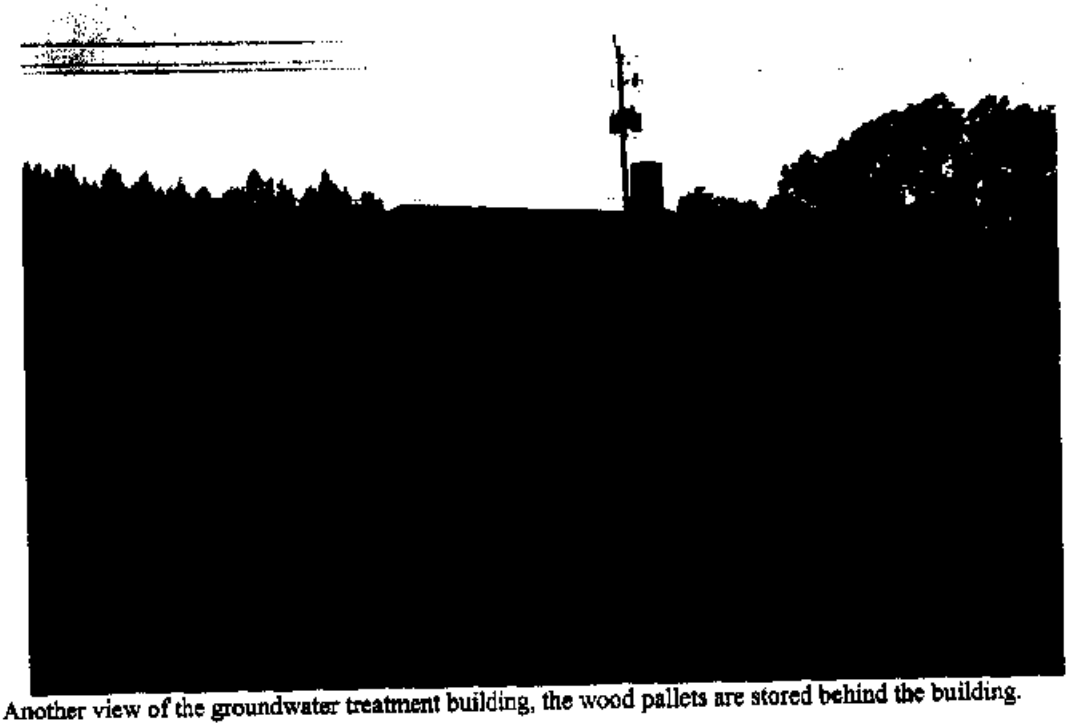
Sign for the Tawara Terrace Housing Development .



Groundwater Extraction and Treatment System housing unit.



Side view of the groundwater treatment building, a drum and the air stripper tray are visible.



Another view of the groundwater treatment building, the wood pallets are stored behind the building.

ATTACHMENT 4

5-Year Review Questionnaire

Site: ABC One Hour Cleaners
City/State: Jacksonville, NC. 28540

Date: May 30, 2003 Phone No. (910) 353-3132

Name of Citizen: Mr. Major Midgett

Address: Major Furniture Co.
2127 Lejeune Blvd, Jacksonville

Do you live near the Site? If yes, how long? Owns business next to site

Are you familiar with EPA activities over the past years? Yes

What is your overall impression of the project? When they first started activities there they pumped out sometime and put in metal drums. The drums were left there over a weekend they leaked. So at first not impressed.

Overall, have you been pleased or displeased with cleanup actions at this Site? Haven't bothered him either way except that the government is spending so much money to clean up the property and water.

What effects, if any, have site operations had on the surrounding community? None that he is aware of.

Do you still have any concerns regarding EPA clean up activities of the Site? Is it getting low - what is the condition of groundwater? Is it getting cleaner? He was on well with both 909, then city water put in. The well was used to sample groundwater.

Do you think you have been kept adequately informed about clean up activities at the Site? No - only contacted when his property was sampled.

Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. No

Is there someone else that you would like to recommend we contact for more information? No

Do you have any suggestions that EPA can implement to improve communication with the public? Yes - anytime there is a problem with land surrounding the site people should be told - he said he was never told if his land was contaminated or not.

Interview conducted by: Diane Barnett
Date conducted: May 30, 2003

5-Year Review Questionnaire for Govt. Officials

Site: ABC One-Hour Cleaners

City/State: Jacksonville, NC.

Date: May 30, 2003 Phone No. (910) 455-0357

Name: Jerry Bittner, Mayor Pro-Tem

Address: Jacksonville, N.C.

What is your overall impression of the project? Lengthy & drawn out & misunderstood by the general public

Have there been routine communications or activities conducted by your office regarding the Site? (Site visits, inspections, reporting activities, etc.) If so, please give purpose and results.

NC

Have there been any complaints, violations or other incidents related to the Site requiring a response by your office? If so, please give details of the events and results.

Not that he is aware of.

Do you feel well informed about the Site's activities and progress? Nothing lately

Do you think clean up activities at the Site have had a positive or negative impact on the community? In what ways?

Generally speaking from something being done to clean up contamination, a good impact.

Do you have any comments, suggestions, or recommendations regarding the Site's management or operation?

More public disclosure of results of cleanup, need to provide more information about what is happening.

Interview conducted by Dina Garrett

Date conducted May 30, 2003

5-Year Review Questionnaire for Govt. Officials

Site: ABC One-Hour Cleaners

City/State: Jacksonville, NC.

Date: 5/30/03

Phone No. (910) 938-5200

Name: Ken Vaspan, City Manager

Address: City of Jacksonville
Jacksonville, N.C. 28540

What is your overall impression of the project? Good job of identifying problems and taking action.

Have there been routine communications or activities conducted by your office regarding the Site? (Site visits, inspections, reporting activities, etc.) If so, please give purpose and results.
None - depending upon authorities to handle.

Have there been any complaints, violations or other incidents related to the Site requiring a response by your office? If so, please give details of the events and results.
None

Do you feel well informed about the Site's activities and progress? Yes, absolutely

Do you think clean up activities at the Site have had a positive or negative impact on the community? In what ways?
Hard to gauge - positive in that drinking water is being addressed

Do you have any comments, suggestions, or recommendations regarding the Site's management or operation?
None

Interview conducted by Diane Barrett

Date conducted May 30, 2003

5-Year Review Questionnaire for Govt. Officials

Site ABC One-Hour Cleaner

City/State Jacksonville, N.C.

Date: May 30, 2003 **Phone No.** (910) 347-2157

Name John Hurian Supv.

Address Onslow Environmental Health Dept.

Jacksonville N.C.

What is your overall impression of the project? Has not had any involvement with Project & is not familiar with clean up questions. Does know there has been groundwater contamination from site that has impacted residential well across Lejeune Blvd.

Have there been routine communications or activities conducted by your office regarding the Site? (Site visits, inspections, reporting activities, etc.) If so, please give purpose and results.

Have there been any complaints, violations or other incidents related to the Site requiring a response by your office? If so, please give details of the events and results.

Do you feel well informed about the Site's activities and progress?

Do you think clean up activities at the Site have had a positive or negative impact on the community? In what ways?

Do you have any comments, suggestions, or recommendations regarding the Site's management or operation?

Interview conducted by Diane Garrett

Date conducted June 3, 2003